August 12, 2003

MEMORANDUM **UTAH DEPARTMENT OF TRANSPORTATION**

TO: Jim McMinimee, P.E., Chairman

FROM: Farrell Wright
Secretary, Standards Committee

SUBJECT: Standards Committee Meeting Minutes and Next Meeting

The next meeting has been scheduled for Thursday, August 28, 2003 at 8:00 a.m., in the main 1st floor conference room of the Rampton Complex. The agenda for the meeting follows.

Item (Action Log Reference follows agenda item number)		**Remarks**	**Sponsor**
1.	Minutes of June 26, 2003	For approval	Farrell Wright
2. (1)	800 Series Standard Drawing Conversion Process (Typical Section discussion)	For approval	John Leonard (Darin Bunker and Steve Ogden)
3. (10)	Standard Drawing GW 10, Delineation Application	For approval	Robert Hull
4. (14)	Standard Drawings TC 17 and TC 18	For approval	John Leonard
5.	Standard Drawings SN 06 and SN 06A, Speed Reduction Sign Sequence	For approval	John Leonard
6.	Standard Drawing ST 09, School Crossing and School Message	For approval	John Leonard
7. (2)	Standard Specifications 09972, Painting for Structural Steel; 09991, Cleaning and Repainting Structural Steel; and 09992, Cleaning and Overcoating Structural Steel	For approval	Boyd Wheeler
8. (3)	Rumble Strip Policy Update	For discussion	Robert Hull
9. (6)	Review of Standards Section Web Survey	For discussion	Farrell Wright
10.	Standard Specifications 01571, Temporary Environmental Controls and 01574, Environmental Control Supervisor	For Approval	Terry Johnson
11.	Standard Specification 02896, Boundary Survey	For Approval	Jim Baird
12.	Standard Specification 13592, Roadway Weather Information System - Environmental Sensor Station (RWIS-ESS) and associated drawings	For discussion	Sam Sherman
13.	Review of Assignment/Action Log	For review	Jim McMinimee
14.	Meeting Improvements (on-going agenda item)	For discussion	Jim McMinimee
15.	Other Business		

JCM/ba
Attachments

cc:

Ahmad Jaber
Director, Region One
Randy Park
Director, Region Two
Tracy Conti
Director, Region Three
Dal Hawks
Director, Region Four

Sterling Davis

Dave Nazare

Darrell Giannonatti

Hugh Kirkham

Tim Biel
Stan Burns

Robert Hull

Jason Davis

Farrell Wright

Barry Axelrod

Carlos Machado, FHWA
Mont Wilson, AGC

Listing of 800 (New DD and related drawings) Series Converted Standard Drawings on Agenda

DD 02	Slope Rounding, Benched Slope, and Cut Ditch Details (815-1)
DD 04	Geometric Design for Freeways (Roadway) (815-1A)
DD 05	Entrance and Exit Ramp Geometrics (825-1)
DD 06	Entrance and Exit Ramp Geometrics (825-1A)
DD 07	Freeway Crossovers (Related Drawings GW 09, Delineation Hardware and ST 02, Freeway Crossover Markings) (805-3)
GW 11	Shoulders and Sidewalks on Urban Roadways (815-6)
DD 14	Typical Rural Two Lane Road With Media Lane and Deceleration Lane for Intersecting Crossroads (825-2)

Listing of TC Standard Drawings on Agenda

TC 17	Traffic Control Single Lane Closure Moving/Intermittent Operation
TC 18	Traffic Control Multi-Lane Closure Moving/Intermittent Operation

June 26, 2002

A regular meeting of the Standards Committee convened at 8:00 am, Thursday, June 26, 2003, in the 1st floor conference room of the Rampton Complex.

Members Present:

Jim McMinimee	Project Development	Chairman
Jason Davis	Engineering Services	Member
Farrell Wright	Standards and Specifications	Secretary
Tracy Conti	Region 3	Member
Dave Nazare	Structures	Member
Darrell Giannonatti	Construction	Member
Richard Clarke for Robert Hull	Safety	Member
Sterling Davis	Maintenance	Member
Tim Biel	Materials	Member
Abdi Fatemi for Mont Wilson	AGC	Advisory Member
Carlos Muchado	FHWA	Advisory Member

Members Absent:

Robert Hull	Safety	Member
Mont Wilson	AGC	Advisory Member

Staff:

Barry Axelrod	Standards and Specifications
Patti Charles	Standards and Specifications
Karl Verhaeren	Region 4
Murari Pradhan	Materials
Howard Anderson	Materials

Visitors:

Joe Gregory	FHWA

Standards Committee Meeting

Minutes of the June 26, 2003 meeting:

1. Minutes of April 24, 2003 meeting were approved as written.

   Motion: Tracy Conti made a motion to accept the minutes as written. Seconded by Dave Nazare. Passed unanimously.

2. 800 Series Standard Drawing Conversion Process (Agenda Item 2) – Item presented by Richard Clark for John Leonard.

   Barry provided a handout from John Leonard listing comments and recommendations for each of the drawings being considered. Richard said he didn't have any more information than that provided in the handout.

   Richard reviewed the drawings and commented on the notes from John. Those notes are included at the end minutes, prior to the Action Log.

   Discussion points were:

   - Jason recapped the issue on the six percent superelevation. He said the way he understood it was that at some point in time the Department had set as a standard a maximum of six percent. Jim commented that this was based on concerns with snow removal and snow packed roads. Jason said that Clair Hendrickson was concerned that someone stopping on a snow packed road that had a superelevation of six percent or greater might slide down the slope. Jason thought we were over designing and spending more money than necessary. Richard said the recommendation is to remove the reference from the drawings and address the issue elsewhere.

   - A suggestion was made to just go with the AASHTO standard on the superelevation issue.

   Richard continued with the next item on the handout. (Note: The reference on the handout to 805-5a should be 810-5a.) Drawing 805-3 was not referenced on the handout.

   Discussion points were:

   - Jason explained how the 800 series drawing updates were developed. Initially the plan was to adopt AASHTO Standards as much as possible. Jason pointed out that John Leonard formed a review group to develop the changes. The drawings were then sent out to all the region design engineers for comments. The comments were incorporated.

- Jim asked for comments on 805-3. He commented to Sterling that he found it interesting to see the double turnaround on the drawing, adding that he didn't remember seeing those being built. Sterling commented on note 13 of the drawing but didn't think they were used very much any more. Sterling said interchanges are used now. Sterling said it might be too risky to make a U-turn using the crossover. Jim asked Sterling if he had a suggestion for a change to the drawing. Sterling said if the double crossover is not being used then it should be taken off the drawing.

- Jim went on to comment about the use of the standard submittal sheet, pointing out the use of the coordination section, listing everyone that was contacted during the process. Barry pointed out that John was supposed to provide a submittal sheet when one was not provided on time. The handout was provided the day before the meeting instead of the submittal sheet. Jim said that 805-3 is an important drawing to Maintenance but it doesn't appear that anyone coordinated with Sterling. Jim questioned the process and whether it had been followed with these drawings.

- Jim asked the Committee if they have reviewed the drawings and want to provide any comments. Jim said it seems that John needs to be back to address issues. Farrell said he has reviewed the drawings during both iterations and has provided and discussed comments with John. Farrell said he knows a lot a care has gone into the process. Richard pointed out that the notes from John refer to several areas that were contacted. Sterling said John might have gotten feedback from the Maintenance people in the field. Barry explained that if a change is published and something is missed a subsequent change could be issued.

- Jim asked for comments on the other drawings. Farrell pointed out that the original 815-1A was crammed with information so he said he suggested that the drawing be split. 815-1 now has just details so the freeway drawing is not always referenced for urban projects. Details are now bigger and easier to understand.

- Dave said the only comments he had were on 815-7A. Referencing the retaining wall and the abutment, Dave said he didn't know what the minimum clearance was. Dave said he would check into it and provide a number. This would apply to the four details on the drawing.

- Darrell suggested that John still provide an updated submittal sheet so the Committee could see the process.

- Dave said he is comfortable approving the drawings based on the process that has been completed so far given that there are only minimal comments on specific drawings. Everyone felt the same way.

- There was still some concern about not following the process because a submittal sheet was not completed. Barry explained that a submittal sheet with updates had been completed when the item was discussed in previous months, just not this time. Jason pointed out the process was actually completed, but just not submitted on the proper form.

- Continuing with the drawing review Jim asked if there were any additional comments on 805-3. Someone asked why do we even have double crossovers. Farrell said he didn't know. This is an item that needs to be answered. Jim asked if this is a new standard. Barry checked the metric version. The detail was on the drawing approved in March 2001. Barry said that the notes and some of the details appear to be different. In response to a question from Jim, Abdi said he has never built a double crossover, but has built the single crossover. He didn't know the radius in response to an earlier discussion.

- Jim said 805-3 needs to be brought back so John can address the questions. Addressing Sterling, Jim said he has concerns on this drawing. He asked Sterling to take the charge on making sure the drawing addresses all Maintenance needs.

Action Item: Sterling to address all Maintenance needs on drawing 805-3 prior to presentation for approval.

- The discussion moved on to 810-5A. The need for note 8 was discussed. Is the requirements specified in the note something that the Department will be doing? Comments indicated that the requirement is common sense. Jason recommended that note 8 be deleted from the drawing. There was no disagreement.

- Drawing 815-1 was covered next. Jim asked Jason to clarify the statement in the fifth paragraph in John's notes, dealing with the cut ditch. Dave said that having a cut ditch at the top of the cut has exacerbated some slide conditions. He gave an example of the situation and explained the situation. Sterling commented on the reverse of the situation. Dave said that we have been using this application for years and it seems to have helped quite a bit in both situations. He added that in isolated conditions it hasn't helped. He recommended giving the designer some flexibility given the situation. Jim asked Dave to work with John to make the needed changes.

Action Item: Dave to address cut slope issues with John on drawing 815-1 prior to presentation for approval.

- Jim commented on note four based on the request from Region One to eliminate the note as referenced in the handout. According to the handout notes John indicated that the note has been there for many years and he recommended leaving the note on the drawing. The Committee agreed with John's recommendation.

- There was a question on the note below the Cut Ditch Flaring Detail of 815-1. The recommendation was to send it back to John for clarification.

- There was no significant discussion on 815-1A. The Committee agreed with John's assessment of the Region One request, referenced in the handout.

- Jim asked for comments on the proposed Note 13 to 815-1A. Jason referred to something about edge of paved shoulder to edge of paved shoulder. He didn't know why the note was being added. Jim said that John would have to address that at the next meeting.

- On 815-2, comments indicated that the "W" on the right side of the Typical Median Left Turn Lane detail couldn't be read in a photocopy. The "W" needs to be moved to the white area of the page, not the shaded part.

- There were no comments on 815-3A or 815-4.

- On 815-6, Jason asked Farrell if this was the drawing they discussed that was in conflict with driveways. Farrell indicated it was. This drawing was not referenced on the handout. Farrell said this use to be the standard for rural roadways and that John has added the Urban Roadway Shoulders detail. The remaining tables from the metric version are not on this drawing. In response to a question from Jim about the notes on the drawing, Barry checked the original metric drawing and said none of the notes were on that drawing. Jim indicated that John needed to provide clarification on this drawing as well.

- On 815-7A, Dave commented about the minimum clearance indicating he would provide the information to Farrell and that the drawing could be approved now from his standpoint.

- Jim asked for comments on 815-7. Jim commented about the construction of the parapet. He asked if it was easy to build. Dave said the contractor uses a form. Abdi said he had not heard of any problems.

- There were no comments on 815-8.

- On 825-1, Jim asked Richard if painted islands used chevrons and if it were a requirement of MUTCD or something we have done from a safety standpoint. Richard said it is not required. The MUTCD requirement is to paint the nose but UDOT has elected to do that in some cases according to Richard. Jim asked if there is any research or evidence that says that is safer. Are we spending money on what we believe to be safer? Richard said they could look into it. The drawing needs to be brought back. Jim concluded by saying that we want to show the most cost effective option on Standards, not always the optimal option, having our people go from there.

Action Item: Traffic and Safety to look into the use of chevrons in relation to safety and cost savings on drawing 825-1 prior to presentation for approval.

- In reference to 825-1A, Jim asked if there was an action item log entry on rumble strips. Barry said there was an entry. Jim asked if that was for just long line rumble strips or did it also include rumble strips in the 825-1A application. Barry said part of the item was a policy on rumble strips. Jim said this is another one of those questions about whether there is a benefit to the application. He pointed out that he is not anti-safety, that he is just asking the question as to what do we get when we buy these items. He concluded by saying he is all for safety. The rumble strip issue needs to be addressed and this drawing bought back.

- Jim asked if there was any motion with respect to this set of drawings.

Motion: Dave Nazare made a motion to approved Standard Drawings 805-1, 810-5A, 815-2, 815-3A, 815-4, 815-7A, 815-7, and 815-8 as discussed and modified. Seconded by Jason Davis.

- Prior to the vote on the motion Barry asked if it would be more confusing for the users to approve just some of the drawings, particularly if the approved drawings cross-reference a drawing that is not approved. Jim asked if there is a benefit in passing some of the drawings. Dave said he didn't see any cross-reference problems. Jim said it shouldn't be a problem given the short time frame involved. Jim asked Barry if his though was to postpone approval of this set until all the drawings are ready. Barry said his comments were based on anticipated questions asking about the other drawings when they publish the next change. Richard asked if not approved now, do we have to go back through all of the drawings the next time. The response was no. Dave said it is his understanding that the designers are waiting on these drawings and that he would like to see this set approved and published.

Motion: Being no further discussion Jim called the question. Passed unanimously.

Priority Three was set for the approved drawings.

Jim commented on the process. He said what we hope to avoid, by having things go through the process of who did you talk too, when, and what was said before coming to the Committee, was this. The conclusion was that someone needed to be available to discuss and answer questions.

3. Standard Drawing GW 10, Delineation Application (Agenda Item 3) - Item presented by Richard Clarke for Robert Hull.

Richard said he was somewhat familiar with what is being done with the change but not what the Committee had discussed so far.

Discussion points were:

- Dave said one of the questions that came up during the last discussion on GW 10 was that it appears that a lot more delineators are being added compared to the past. He said there is a fairly significant Maintenance cost associated with each delineator. He asked if this is something required by MUTCD. Dave said this gets back to what Jim was saying earlier about the cost benefit. Do we know if there is a value to the Department for adding these delineators?

- Richard said this was brought up to the Traffic Engineering Panel (TEP). The concern was that the drawing did not show the additional delineators so a change order was needed every time those were wanted. This gives the option of adding the extra delineators where the TEP felt the additional delineators were needed.

- Dave said the additional delineators would now be on every single project. Richard said the intent was not to say they are required on every one, but to allow them on as needed basis. Richard commented that maybe that was not what was being said with the change. Farrell said if this becomes a Standard then a Design Exception would be needed to change a project. Richard said he knows what was discussed, but not the intent.

- Farrell said his concern with the process deals with the region thought process. He asked why do the Regions want to change from a Standard. He said this happens a lot and that is frustrating. Farrell commented that if a Standard works why do the Regions want to put in more details. If it doesn't work then it should be brought to the Committee.

- Dave said he is more in line with what Jim said earlier that the Standard should be the minimum that is required and that the flexibility exists if they want too. In the initial design we want to look at the minimum required and what is the best value for dollars spent.

- Jason said that Research was supposed to look into standards common to rural states in relation to the MUTCD. Sterling commented, saying are we trying to take something that is optional and make it mandatory. Richard said he didn't know but that is what it appears. Jason said this could be something that Safety keeps to insert as needed as a detail sheet. The key is that they are involved in the design process and not be something that is added after advertisement.

- Further discussion was tabled until the next meeting.

4. Standard Drawing TC 17, Traffic Control Single Lane Closure Moving/Intermittent Operations and TC 18, Traffic Control Multi-Lane Closure Moving/Intermittent Operations (Agenda Item 4) - Presented by Richard Clarke for John Leonard.

There was no submittal sheet for this item.

Discussion points were:

- Jim said he had received a phone call from a Maintenance Engineer who had a Traffic Engineer in his office. They were very concerned about this moving operation. The Maintenance Engineer didn't know if this was the right thing to do. Jim added that when John completes the submittal sheet he should talk to some Maintenance people. He said the comments were actually about TC 18.

- Further discussion was tabled until the next meeting.

Action Item: John to review drawings and coordinate with Maintenance people prior to presentation for approval.

5. Standard Specification 01452, Profilograph and Smoothness (Agenda Item 5) - Presented by Howard Anderson and Murari Pradhan.

Murari introduced the item. He said that Smoothness was added to the Specification. Smoothness criteria from several specifications were moved to one location, making it easier to find. He pointed out that as a Special Provision this specification has been successfully used on two or three projects in Region 4. Murari said part one of the specification was completely changed.

Discussion points were:

- Dave asked if the word "Pavement" needed to be added to the title in front of "Smoothness" or is it obvious in the meaning that we are talking about pavement. Murari said that could be done.

- Comments indicated the submittal sheet was very thorough.

- Tim pointed out that a lot of the changes are just relocation from other specifications, asking Murari to discuss concept changes.

Murari went on to discuss the changes including the various smoothness tables.

Discussion points were:

- Karl, as one of the people instrumental in putting together the specification discussed several of the key components. He pointed out that incentives have gone back several years, discussing some of the criteria.

- Darrell asked if we are still including shoulders in smoothness. Karl said yes, if the shoulders are a certain width. He went on to explain the process.

- Karl said he anticipates coming back to make adjustments if the specification is approved as a standard because as a special provision it has not gotten wide spread usage. He did say he was comfortable with the specification. In response to a question he said it has worked well.

- Dave commented on the General Requirements of article 1.3. He said that the Contractor is directed to the HMA requirements for Qualify Control. Dave asked about Portland Cement Concrete Pavement. Murari said that could be added.

- Referring to 1.4 D that states the Department does not measure the PI for Class II surfaces and 1.4 E that includes both Class I and Class II surfaces, Dave asked if this is a contradiction. Karl, referring to Table 01452-1 said that the Class II PI is not applicable but the Contractor may still have to grind based on the profile deviation.

- Karl went on to point out some wording that needed to be modified. He said article 1.5 Measurement and Payment Procedure was added and that 1.4 G should be moved to 1.5.

- Karl said his main concern with this becoming a Standard deals with communication so that everyone knows it is there. Jim suggested that Darrell or someone in Project Development put together a technical bulletin to get that information out. Karl said with the incentive/disincentive he was worried that someone could get caught by surprise.

- Tim said everyone needed to realize that one significant change was not highlighted. He said we never had a disincentive before other than the requirement to grind out bumps to meet the PI. He went on to explain the process and how the disincentive comes into play. Abdi also discussed the must grind and incentive/disincentive process.

- Tim said this issue was brought to the Department through the Pavement Council.

- Jim commented about the submittal sheet, congratulating Murari on doing a great job putting it together and contacting a lot of people both inside UDOT and outside. Murari said that a lot of people were involved.

- Directing his comments to Karl, Jim said he knows there have been a lot of discussions in TRB about Profilographs and the correct use of Profilographs and how to improve that. Jim said he knows that John Butterfield was in a session at TRB that he also attended. He said the two of them discussed some ideas on how to make that applicable. Jim asked if that information made it into this specification or is it something that is still outstanding assignment for John.

- Murari said they put a requirement in the specification that said all operators needed to be certified and all the Profilographs needed to be calibrated and certified.

- Barry asked about the priority. The submittal sheet indicated a Priority 2.

Motion: Darrell Giannonatti made a motion to approved Standard Specification 01452 as modified. Dave reminded everyone of the requirement to add PCCP to the specification. Seconded by Dave Nazare. Passed unanimously.

Farrell pointed out the priority listing and definitions at the end of the submittal sheet file that is now being used. He also pointed out that the suggested Priority 2 would impact all projects being advertised. Following discussion the priority was changed to a 3.

Action Item: Darrell or someone in Project Development to put together a technical bulletin advising all interested parties of the change.

6. Standard Specification 02962, In-Place Cold Recycled Asphaltic Base (Agenda Item 6) - Presented by Howard Anderson.

Howard began by providing an overview of the specification and a technical review of the process. He emphasized that it is a cold process and the temperature of the material needs to about 50 degrees F and 70 on the pavement. He went on to discuss the mix design and laydown processes. He pointed out that it is a fairly cost effective process. Howard said this material has been used in Region 4 since 1986. He said he looked at seven projects that it was used on. Howard said the specification went through the Utah Pavement Council last fall and was ready to be approved except for the mix design process. At that time wording needed to be worked out so that it was clear. Howard said the wording has been cleared up. The process was written up as Mix Design procedure numbered as 8-970 for their Manual of Instruction and approved by Dick Laubsch at FHWA.

Howard said they decided to separate Measurement and Payment for the emulsion because you can't always tell how much emulsion you are going to use. He said they wanted to take that risk away from the Contractor so the Contractor didn't have to put it in the bid.

Discussion points were:

- Darrell commented about finding a good Contractor when using this process. Howard thought the control in the specification when combined with the right Engineer would result in a good product. Howard said because the product is accepted on a nuclear testing basis you will know right away and be able to stop the Contractor without having a lot of material put down like with a hot material where you don't know until the next day.

- Discussion continued on the meaning of a good Contractor and what makes the process work.

- Howard pointed out that this is a new standard that has been used on seven projects and that he is comfortable with it.

Motion: Darrell Giannonatti made a motion to approved Standard Specification 02962 as presented. Seconded by Tim Biel.

- Prior to the vote Dave asked if the fact that UDOT was paying for the emulsion needed to be in the body of the specification somewhere. Referring to the submittal sheet Howard pointed out the recommended change to Measurement and Payment and that it has to be very clear that emulsion is paid separately. He said this helps to have control of the process.

Motion: Being no further discussion Jim called the question. Passed unanimously.

Priority Three as specified on the submittal sheet.

7. AASHTO's Guidelines for Geometric Design of Very Low-Volume Local Roads ADT ($\leq$ 400) for mainly Local Government Projects (Agenda Item 7) - Presented by Jason Davis.

Jason said based on a letter from AASHTO, the Standards Committee was asked to look at the Guidelines to see if something could be incorporated into the Department's design standards. Jason said that Farrell put together a meeting to discuss this. He commented that the meeting was more poorly attended than he had hoped. Jason, Farrell, Merrell Jolley, and George Thompson attended the meeting. Jason said what came out of the meeting was that these are guidelines, not standards. As such, if we design by them it still requires design exceptions. Jason said this was discussed at the WASHTO meeting and the decision was to monitor usage, the number of design exceptions, and cost savings for example. If that justifies it becoming a standard then WASHTO will take it to AASHTO.

Discussion points were:

- Jim said that in our Stewardship agreement we say we will use AASHTO Standards on the Interstate System and NHS for example. He asked if it were not the case that there is a part of the Federal Funding that we don't have to use AASHTO Standards on. Jim said this allows us to adopt different standards on Local Government projects. Dave said that was correct but they have to be applied statewide. Jim asked how does this apply to what Jason said about requiring design exceptions. Jim asked if we were to adopt these low volume guidelines for low volume Local Government projects why would we not be able to use those as policy instead of guidelines. Use them for Standards instead of guidelines.

- Jason said he thought the question before his group was do we want to use these to design these types of facilities. He said no one in the group had enough familiarity with these Guidelines to make them a statewide standard to use all the time. They felt if they required design exceptions the justification could be used to catalog the usage to see if there was a need to adopt them as a standard.

- Farrell read from the forward to the Guidelines. "These Guidelines may be used in lieu of the guidance for Policy for Geometric Design. The guidance presented here will be incorporated in a future edition of this policy." He said WASHTO is asking that we track what is being used so they have more of a push to get them incorporated into this book quicker than in the past. The design exception could be used to track this.

- Dave asked if the ADT of 400 or less was a 20-year projection. Farrell said he didn't know, adding that he didn't read it in the Guidelines.

- Jim said he was looking for these Guidelines as a way for us to address some problems we have been having with our Local Government projects. He said we continue to get asked questions by the Local Governments about why are we making them use AASHTO full design standards when it is a road with extremely low volume.

- Jason asked if any state roads meet these criteria. Jim said he is positive that we do. Possible examples were given. Jason commented about the term "Local Road" in the title of the Guidelines. Does this mean that state roads are not eligible? Jason said these are questions that still need to be addressed. Jason said they would explore this further, adding that they weren't asking that these Guidelines be adopted as a standard at this meeting. He said the presentation was more to show what they were proposing to do in the interim until they were comfortable in asking for them to become a standard. Jim said we need to fully understand the implications to our Stewardship Agreement.

- Jason says he now has enough information to take the next step forward.

Action Item: Jason to pursue the issue and present findings and recommendation during the October 2003 meeting.

8. Standard Specification 00727, Control of Work, 1.5B Discrepancy Ranking Issue (Agenda Item 8) - Presented by Farrell Wright.

Farrell said that the discussion came up as a question during the Standards Sections last region visit. Since Measurement and Payment has been broken out of the Specifications as a separate document should that be one of the ranking parts of this Specification? Farrell said that just the single page from 00727 has been included for the discussion. He said Measurement and Payment was added to the bottom of the items, at number 5.

Discussion points were:

- In response to comments Farrell said that Measurement and Payment is not currently part of the priorities, but prior to the 1999 Specification Book was part of the Specifications.

- Jason asked if the Regions had a recommendation as to the ranking. Farrell said they did not. While they felt it should be between Plans and Standard Specifications they didn't feel placement was that critical. Farrell said he thought it should be number three in the listing.

- Tim asked about the conflict that would require this change. He said he didn't see an overlap that would require coordination. Karl said there could be a conflict if printouts or plans had something different. He added that the only time the hierarchy comes into play is if there is an error somewhere. Karl said that while he had never considered it before, after this discussion he thought it would fall right after Special Provisions.

- Jason asked if the Contractors rely more on the Plans or Measurement and Payment. Following comments by Abdi, the determination was that Measurement and Payment would never conflict with the Plans but should be ahead of the Specifications. Abdi said he thought it should be number three because Measurement and Payment is no longer in the Specifications.

- Jim said there could be a possible conflict with Summaries that are in the Plans. Abdi said there are also summaries in each item.

- Jim asked Farrell if he had enough information. Farrell indicated that he did. Jim then said that while the item was listed for discussion did he want to consider it for approval. Again Farrell indicated that he did.

Motion: Jason Davis made a motion to approve Standard Specification 00727 as modified. Seconded by Tracy Conti. Passed unanimously.

Priority Three was specified.

9. Review of Assignment/Action Log (Agenda Item 9)

Jim asked Barry to review the log and provide updates.

Discussion points were:

- Item 1, 800 Series drawings: Some of the drawings were approved. The remainder will be brought back to the next meeting in August.

- Item 2, 09972 (Painting for Structural Steel), 09991 (Cleaning and Repainting Structural Steel), and 09992 (Cleaning and Overcoating Structural Steel): No change. The target date is still the August meeting.

- Item 3a, Incentive payments for smoothness, 01452 (Profilograph and Smoothness): Approved. Closed.

- Item 3b, Standard Specification 01452 (Profilograph and Smoothness): Approved. Closed.

- Item 4, 02962 (In-Place Code Recycled Asphaltic Base): Approved. Closed.

- Item 5, Rumble Strips: There were no further updates. Item to be covered at the August meeting.

- Item 6, 00727 (Control of Work): The item is not due until August.

- Item 7, Black Paint issue: The item is not due until August.

- Item 8, Numbering system and specification format: Barry said they are still trying to get something put together for a web survey. The target date updated to August.

- Item 9, 00725 (Scope of Work): The item is not due until August.

- Item 10, 01284 (Prompt Payment): The item is not due until August.

- Item 11, Painted Cattle Guard: The item is not due until August.

- Item 12, Standard Drawing GW 10 (Delineation Hardware): The item was covered under Agenda Item 3 but not approved. The drawing will be brought back in August.

- Item 13, Standard Specification 00555, Prosecution and Progress: The item is not due until August.

- Item 14, BA Series Standard Drawings: Barry said that checking drawings for standardization is part of what they do for all drawings. There is no need to track this. Closed.

- Item 15, AASHTO's Guidelines for Geometric Design of Very Low-Volume Local Roads ADT ($\leq$ 400): This was covered in Agenda Item 7 with an October date set.

10. Meeting Improvements (on-going agenda item) (Agenda Item 10). Jim asked if anything could be done to improve today's meeting.

- Consensus was that if the person responsible for an item was not available the item would be postponed. Jim asked about incorporating this in the current process. Farrell said that from their standpoint when they receive an item for approval or discussion they would let it be known at that time that the presenter will attend the meeting or the item will be pulled.

- Comments indicated that even if the scheduled presenter had someone covering for them additional information may be needed that only the original presenter would have. Farrell suggested adding a note to the beginning of the submittal sheet spelling out the requirements.

11. Other Business

None

Motion made and approved to adjourned.

The next regular meeting of the Standards Committee has been scheduled for Thursday, August 28, 2003, at 8:00 a.m., in the 1st floor conference room of the Rampton Complex.

Approval of Minutes: The foregoing minutes were approved at a meeting of the Standards Committee held _____, 2003.

Inputs from John Leonard for the 800 Series Drawings

As you know, we have sent the 800 Series drawings out several times for review, at different stages of development. They were sent to all of the Region Preconstruction Engineers, Maintenance Engineers, Traffic Engineers, and Senior Project Managers; Complex Traffic, Maintenance, Project Development, Division leaders, and other interested persons, including FHWA. Each email requested the individuals review these drawings with their staff, and provide any comments on them. The response was great, and all comments were reviewed. Some were very good--things that were immediately incorporated. Some created discussions that resulted in the a different modification, and some were not used. Each time we sent them out, the comments were less. With the last set, which was sent out at the same time as the sheets were submitted to Standards, we only received three sets of comments. Two had minor changes, including a typo or two, which can be handled easily. The last one was received from Rex Harris in Region One (he and his staff have provided valuable input throughout the process). He requested a personal meeting with his staff to discuss all of the drawings in-depth. The meeting occurred on Tuesday, 6-24, for many hours, and included Roland Stanger of the FHWA. Roland has been a valuable resource in the review and development of the drawings, providing many hours of his time to help out the Department. During this meeting, they asked if we would consider some potential changes to the drawings. Some are minor, and could be done without any problem. Others may be more global, but all would require the consensus of the Standards Committee if approval is given to the drawings on Thursday. Unfortunately, I will be out of town (in Oregon on vacation) on this day, and will be unable to present the drawings to the Committee. I would request the Drawings be approved, with any conditions the Committee see appropriate, and we will make those modifications and then give the drawings a final numbering sequence.

The minor changes to the drawings, and the issues from Region One are as follows:

805-1

The old drawings used to have a maximum superelevation of 6% for any highway on our system, regardless of type. The request was to place this on the drawing as a note. This is a reasonable request if this is the desire of the Committee to continue this maximum rate. We can do it by adding a note to this drawing and on every drawing that references superelevation.

A request was made to add a note saying "MAINTAIN A LINEAR TRANSITION FROM THE BEGINNING OF TANGENT RUN OUT TO THE FULLY SUPERELEVATED SECTION." The rationale is that is will provide a consistent method of modeling the cross-section. It is a reasonable request.

~~805-5a~~ 810-5a

A typo--On Table II, the units of 'D' are 'FT.' (Minor)

We will clean up and clarify the drawing around the upgrade profile to show the end point in better relation to the transition length. (Minor)

Region One has asked us to eliminate Note 8--they believe it is a scoping comment only,

and should not be in the standard drawing. It is the wording that has been there for many years, and provides direction to the designer. We propose to leave it in place unless the Committee directs other wise.

815-1

We will identify pavement thickness and insert the note as used on other sheets. This will provide conformity and not change the drawing. (Minor)

The rounding detail will be modified to add the words 'or fill' to reflect its use in both applications, not just a cut. (Minor)

The title will be modified to reflect there is a benched slope detail. (Minor)

The benched slope detail will have the small print under the title removed. This will allow the designer to determine which is the best method of creating the slope, and reference the detail as necessary. Currently, the way it is written requires all slopes to be built this way. The practice in the field is to use different methods as appropriate.

Region One has requested a review of the use of the cut ditch at the top of a cut when the surface drainage is towards the cut. This is reflected in both the drawing of the cut ditch flaring detail, and in Note 5. This detail and note is on many additional sheets. It is there to catch the drainage as is comes down the slope, and prevent erosion. There is a belief that sometimes it is better to allow the drainage to sheet over the cut rather than concentrating the runoff in on spot or ditch. We can add at the end of Note 5 the words 'where needed' or 'as required', which would leave some flexibility up to the designer. We all agreed that we would abide by any decision by Dave Nazare's group and that of the Committee. Any decision would be applied to all applicable sheets.

Region One has asked us to eliminate Note 4--they believe it is a vague and that it should be left up to the designer or inspector to make the transitions look good, and that this note should not be in the standard drawing. It is the wording that has been there for many years, and provides a general direction to the designer, the inspector, and even maintenance. It is on several of the drawings. We propose to leave it in place unless the Committee directs other wise.

815-1a

We will modify Note 4 so that it reads better by splitting it onto two lines--no change to content. (Minor)

We will show clear zone in the center median as on other drawings for consistency. (Minor)

A typo--on the right side of the drawing, in the portion on 10' shoulders, it should read 'REQ'D ON 6 <u>OR MORE</u> LANES' (Minor)

For clarification we will modify the slope to say 6:1 'OR FLATTER' and 1' MIN (Minor)

We will add a note (13) that says 'RANGE OF SUPERELEVATION IS THE PAVED WIDTH.' This will provide for consistency of design. (Minor)

Region One has asked another global question. They are requesting that the typical cut and fill slop details be deleted from this and all other drawings. They believe it should be left up to the designer to detail these, and should be unique to each design. Our research on this indicated that these ranges were essentially a way to economically provide for the cuts and fills as required for a project, and were to be used as guidance in the design process. We believe that they should be retained, and if there is a difference, then use a design exception to get what the designer would otherwise like. If we generate enough requests for exceptions, then the details could be reworked or deleted from the drawings in a future modification. The drawings are flexible, and can be modified to reflect how the Department is doing business. These details provide guidance as to what a general design may entail.

Region One also requests us to revisit Note 11. Note 11 prefers the hinge point of a cut or fill to be at the clear zone of 30'. They believe that Note 2 provides adequate guidance to the designer, since it refers to clear zone. While Note 11 may be repetitive in relation to clear zone, it is also providing direction to remove potential conflicts as far away as practical in the design. It is valid, but can be removed if the Committee determines so.

815-2

Clarify slope as 3:1 'or steeper.' (Minor)

In Typical Median Left Turn Lane, remove 'W' from inside median to another location for clarity (it can't be seen when photocopied). (Minor)

815-3a

Clarify slope as 3:1 'or steeper.' (Minor)

Delete '10' MIN' and arrow on 10:1 slope on all three details. It is a variable distance based on clear zone. Not a fixed distance. (Minor)

815-4

Delete '5' MIN' and arrow on 10:1 slope. It is a variable distance based on clear zone. Not a fixed distance. (Minor)

815-7a

Correct typo in title 'Design'. (Minor)

Request for Dave Nazare's group: Is there a minimum horizontal distance for the small area between the retaining wall and the abutment for access for inspection? (ie, does it have to be wide enough for a person, and if so, does it need a fall protection barrier?) We

show a minimum vertical distance. This space is shown on the right side of all three details in the upper right corner.

825-1

Will clean up island details, and reference Standard Drawing ST5 for the painted island details. This is in conformance with other sheets. (Minor)

825-1a

Will place a table for both 'L' and 'D' as is done on other drawings. (Minor)

On the Exit Ramp detail, the arrow for the 12' lane width points to the wrong line. The arrow head will be moved to the correct line. (Minor)

All minor changes will be made to the drawings. They do not affect the concept as presented, and only clarify or bring the drawings into the same format and layout at the other drawings. We will make any of the other changes as directed by the Committee.

Thank you for taking the time to present these changes and proposed modifications to the Committee for their evaluation and approval.

John L.

Assignment/Action Item Log (Updated June 26, 2003)

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
June 27, 2002	1	Team to review Series 800 Standards prior to presentation to the Standards Committee	Research, Safety, Farrell, Clair, and Jason	Open	August 2003 meeting
August 29, 2002		Drawings that were not deleted to be looked at for modification and consolidation. Notes from deleted drawings to be considered for inclusion in remaining drawings or elsewhere.	Robert and Jason		
		Structures to look at 815-7 (Structure Geometrics Design Standards) and 815-8 (Railroad Clearance at Highway Overpass Structures).	Dave and Boyd		
October 31, 2002		Drawings to be completed for the December 19 meeting.			
December 19, 2002 February 27, 2003		Drawings still being worked. Task group to coordinate and update the drawings as required.	John Leonard		
April 24, 2003		Drawings still being reviewed.			
June 26, 2003		805-1, 810-5A, 815-2, 815-3A, 815-4, 815-7A, 815-7, and 815-8 approved. Remaining drawings to be brought back.	John Leonard		
		Address all Maintenance needs on drawing 805-3 prior to presentation for approval.	Sterling Davis		

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
June 26, 2003		Continued. Look into the use of chevrons in relation to safety and cost savings on drawing 825-1 prior to presentation for approval. Address cut slope issues on drawing 815-1 prior to presentation for approval	 Robert Hull Dave Nazare		
June 27, 2002 October 31, 2002 December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	2	Review 09972 (Painting for Structural Steel), 09991 (Cleaning and Repainting Structural Steel), and 09992 (Cleaning and Overcoating Structural Steel) to clean up the specifications. Structures reviewing with Materials for proposed changes. The item will be shown with an August 2003 date. Structures to send letter to paint contractors. No change in status.	Structures Boyd Wheeler Bill Lawrence Boyd Wheeler	Open	August 2003 meeting

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
June 27, 2002 October 31, 2002 December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	3	Standard Drawing PV 8 (Rumble Strip) Process being reviewed. Research looking into testing. A policy is to be developed over the next several months. No change No further updates. Target date changed.	Darrell to assign someone from Construction. Richard Miller from Maintenance. Fred Doehring. Betty Purdie. Robert Hull to head the group. Robert Hull Stan Burns Robert Hull Stan Burns	Open	August 2003 meeting
August 29, 2002 December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	4	00727 (Control of Work), wording of 1.6B & C (Contractor Cooperation) and 1.8 (Cooperation Between Contractors). Construction working with AGC on inputs Update target date. New review procedure established by Construction No change. Not due until August.	Hugh Hugh, Mont Darrell	Open	August 2003 meeting

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
Revisited from October 2001 and December 2001 Standards Meetings	5	Black Paint issue on lane striping. Review by Traffic Engineering Panel	Robert	Open	August 2003 meeting
October 31, 2002		Item to the Traffic Engineering Panel.	Robert		
December 19, 2002		Traffic Engineering Panel and Task Group working on issue.	Robert		
February 27, 2003		Update target date.	Robert		
April 24, 2003		Traffic Engineering Panel to discuss in July			
June 26, 2003		No change. Not due until August.			
October 31, 2002	6	The numbering system for specifications to be looked at as well as format. Questionnaire in the general packets for Engineering Conference.	Farrell Wright	Open	August 2003 meeting
December 19, 2002 February 27, 2003 April 24, 2003		Standards to put together an on-line survey to gather more information on Standard Specification format and numbering and Measurement & Payment Document issues	Farrell Wright Barry Axelrod		
June 26, 2003		Survey and web page still being developed. Target date changed to August			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
October 31, 2002 December 19, 2002 April 24, 2003 June 26, 2003	7	00725 (Scope of Work). Construction to discuss wording with AGC and Region Engineers Obtain inputs from Construction Engineers Being reviewed based on new Construction procedure. No change. Not due until August.	Darrell Giannonatti Darrell Giannonatti	Open	August 2003 meeting
December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	8	01284 (Prompt Payment) discussion delayed for further review by AGC. Being reviewed by Construction. No change. Not due until August.	Chuck Larson Darrell Giannonatti	Open	August 2003 meeting
December 19, 2003 February 27, 2003 April 24, 2003 June 26, 2003	9	Painted Cattle Guard: With assistance from Research Division, Traffic and Safety to make recommendation. No status. Traffic Engineering Panel to review No change. Not due until August.	Glenn Schulte John Leonard	Open	August 2003 meeting

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
February 27, 2003 April 24, 2003 June 26, 2003	10	Standard Drawing GW 10 (Delineation Hardware). Research to look into the use of delineators and the impact on traffic. Research also to look into standards common to rural states in relation to the MUTCD. Coordinate changes within the Maintenance Division. No change Discussed but not approved.	Research Sterling Davis Robert Hull	Open	August 2003 meeting
February 27, 2003 April 24, 2003 June 26, 2003	11	Standard Specification 00555, Prosecution and Progress. Postponed. Present at next meeting Being reviewed based on new Construction procedure. No change. Not due until August.	Jeff Saddler Bob Dyer Larry Myers Darrell Giannonatti	Open	August 2003 meeting
April 24, 2003 June 26, 2003	12	Team to review AASHTO's *Guidelines for Geometric Design of Very Low-Volume Local Roads ADT (≤ 400)* for approval for use as well as Local Government projects. Further pursue the issue and present finding and recommendations.	Jason Davis Jason Davis	Open	October 2003 meeting
June 26, 2003	13	Develop a technical bulletin advising all interested parties of the change to Standard Specification 01452, Profilograph and Smoothness.	Darrell Giannonatti or Project Development	Open	Prior to publication of change to specification

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
June 26, 2003	14	Standard Drawing TC 17, Traffic Control Single Lane Closure Moving/Intermittent Operations and TC 18, Traffic Control Multi-Lane Closure Moving/Intermittent Operations. Review drawings and coordinate with Maintenance people prior to presentation for approval.	John Leonard	Open	August 2003 meeting

Closed Items From Last Meeting (June 26, 2003)					
Date Initiated/Updated	Prior Item #	Action	Assignments	Status	Target Date
June 27, 2002 October 31, 2002 December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	3a	Incentive payment for smoothness should be looked at. Standard Specification 01452 (Profilograph and Smoothness). Materials working updating the specification based on special provision inputs. Still on track The change is being evaluated. Approved	Darrell and Howard Howard Anderson	Closed	Closed
December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	3b	Standard Specification 01452 (Profilograph and Smoothness) Materials working on updating specification for Zero Blanking Band and related information. No change Approved with 3a	Howard Anderson	Closed	Closed

June 27, 2002 October 31, 2002 December 19, 2002 February 27, 2003 April 24, 2003 June 26, 2003	4	Review specification so that all the issues are addressed. Standard Specification 02962 (In-Place Cold Recycled Asphaltic Base). Still in-progress Approved	Darrell, Tim, and Howard Tim Biel, Howard Anderson, Larry Gay	Closed	Closed
April 24, 2003	14	BA Series Standard Drawings to be reviewed for standardization before publication	Farrell Wright	Closed	Closed

Standards Committee Agenda Items Section

Submittal Sheets, Standard Specification Drafts, Standard Drawing Drafts, and other supporting data for the August 28, 2003 Standards Committee meeting follows.

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Slope Rounding, Benched Slope, and Cut Ditch Details**
Specification/Drawing Number: **DD-2**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 815-1.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about the detail note on the Cut Ditch Flaring Detail. The assignment was to have the Structures Division under Dave Nazare review and suggest different language for the detail note. The note language was changed and approved by Dave Nazare, and the revision was made to the Drawing. Note 5 was also changed to include the additional language requested by the Committee for the drainage of the surface ditch. No other changes were made.

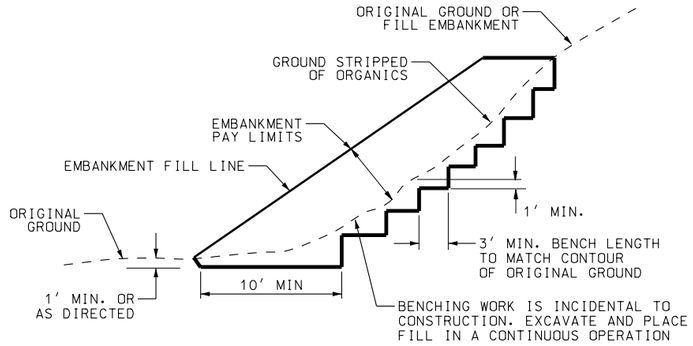
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

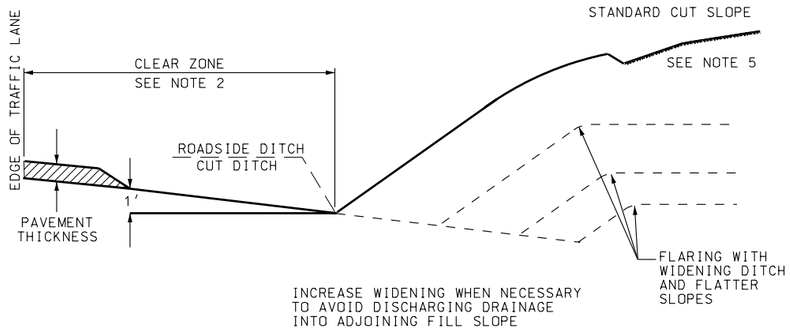
Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

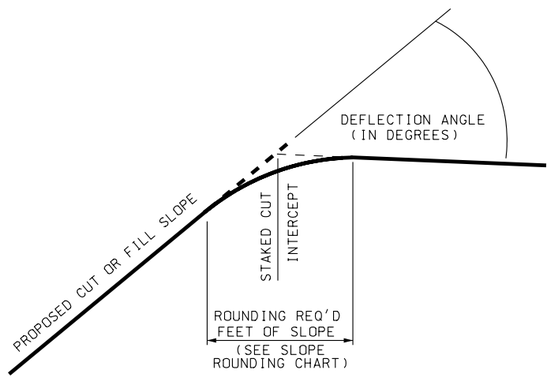
Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.



BENCHED SLOPE DETAIL



CUT DITCH FLARING DETAIL



SLOPE ROUNDING DETAIL

SLOPE ROUNDING CHART (FEET)					
		SLOPE HEIGHT (FEET)			
		5-15	15-30	30-60	60+
DEFLECTION ANGLE(DEG.)	10-20	5	6	8	10
	20-30	10	12	16	20
	30-40	15	18	24	30
	40+	20	24	32	40

SLOPE ROUNDING REQUIRED FOR THE SIDES OF CUT SLOPES AS WELL TOP OF CUT SLOPES.

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY EXTEND INTO CUT OR FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDTIONS PERMIT.
4. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
5. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR TO ROADSIDE DITCH.
6. PAVEMENT THICKNESS CONSISTS OF UTBC AND HARD SURFACING ONLY.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — DATE

DEPUTY DIRECTOR

(ENGLISH)

SLOPE ROUNDING, BENCHED SLOPE, AND CUT DITCH DETAILS

STANDARD DRAWING TITLE

STD. DWG. NO.

DD 2

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Geometric Design for Freeways (Roadway)**
Specification/Drawing Number: **DD-4**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 815-1A.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about the note for the surface ditch. The assignment was to have the Structures Division under Dave Nazare review and suggest additional clarification for the note. The Note 8 language was modified with the additional language, and was approved by Dave Nazare, and the revision was made to the Drawing. An issue was also raised on the usefulness of Note 13. Region One recommended this Note. The intent of the Note is to make the section that is rotated under super elevation uniform from project to project. No other changes were made.

Priority Explanation

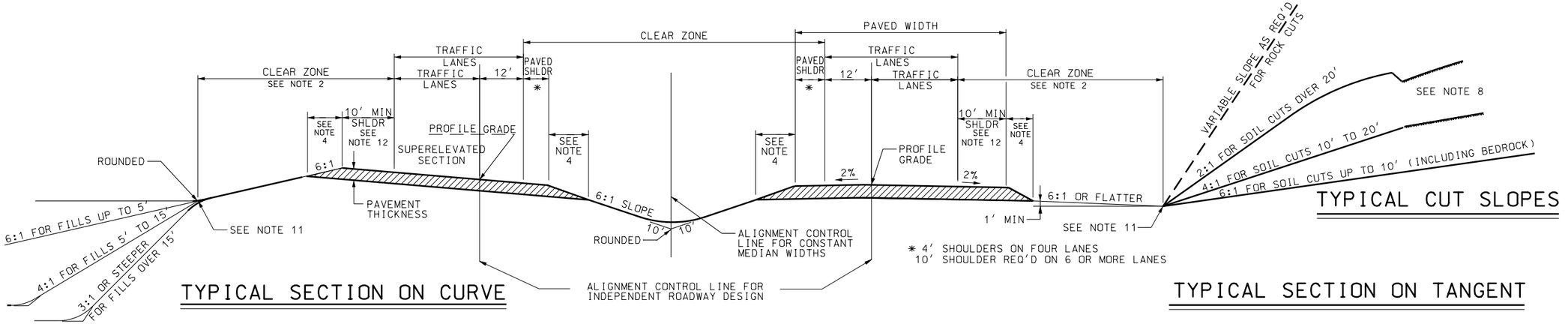
Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

MULTI-LANE

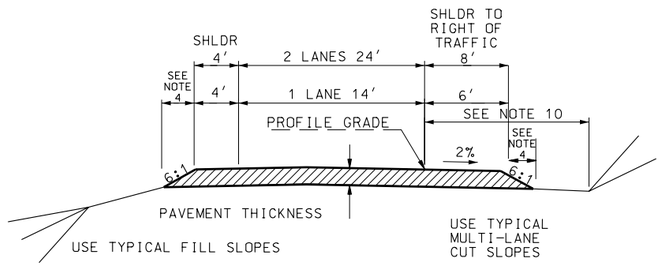


TYPICAL SECTION ON CURVE

TYPICAL SECTION ON TANGENT

TYPICAL CUT SLOPES

TYPICAL FILL SLOPES



TYPICAL RAMP

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY INCLUDE CUT OR FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDTIONS PERMIT.
4. MAINTAIN A CONSTANT WIDTH TO THE NEAREST 1/2 FOOT AND PROVIDE A SLOPE OF 6:1 OR FLATTER IN A NORMAL SECTION WITH A 2% SLOPE.

   PROVIDE A SLOPE OF 6:1 OR FLATTER UNDER CONDITIONS OF SUPER ELEVATION.
5. PROVIDE BACKSLOPE ROUNDING FOR ALL CUTS STEEPER THAN 4:1 AS PER ROUNDING DETAIL, STD DWG DD 2.
6. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
7. PAVEMENT THICKNESS CONSISTS OF UTBC AND HARD SURFACING ONLY.
8. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR ROADSIDE DITCH.
9. SEE STD DWG DD 2 FOR TYPICAL SECTION ON DITCH FLARING AND BENCHED SLOPE.
10. DESIGN SPEED CHANGES THROUGHOUT LENGTH OF RAMP. USE APPLICABLE CLEAR ZONE.
11. USE A MINIMUM 30′ HINGE POINT TO BE MAINTAINED FROM EDGE OF TRAFFIC LANE.
12. USE A 12′ MINIMUM OUTSIDE SHOULDER WHEN HEAVY TRUCK TRAFFIC EXCEEDS 250 DDHV.
13. RANGE OF SUPERELEVATION IS THE PAVED WIDTH.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — DATE

DEPUTY DIRECTOR

(ENGLISH)

GEOMETRIC DESIGN FOR FREEWAYS (ROADWAY)

STANDARD DRAWING TITLE

STD. DWG. NO.

DD 4

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Entrance and Exit Ramp Geometrics**
Specification/Drawing Number: **DD-5**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 825-1.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about the use of painted chevron markings in the gore area of the island detail. The assignment was to review the apparent mandatory use of these markings, and the long term impacts of their placement. The intent was not to be mandatory, but to provide another tool if the designer/maintainer believed it was necessary. The detail notes were modified to reflect this by clarification with the addition of word 'optional' placed in the two locations that chevron markings were located. These revisions were made to the Drawing. No other changes were made.

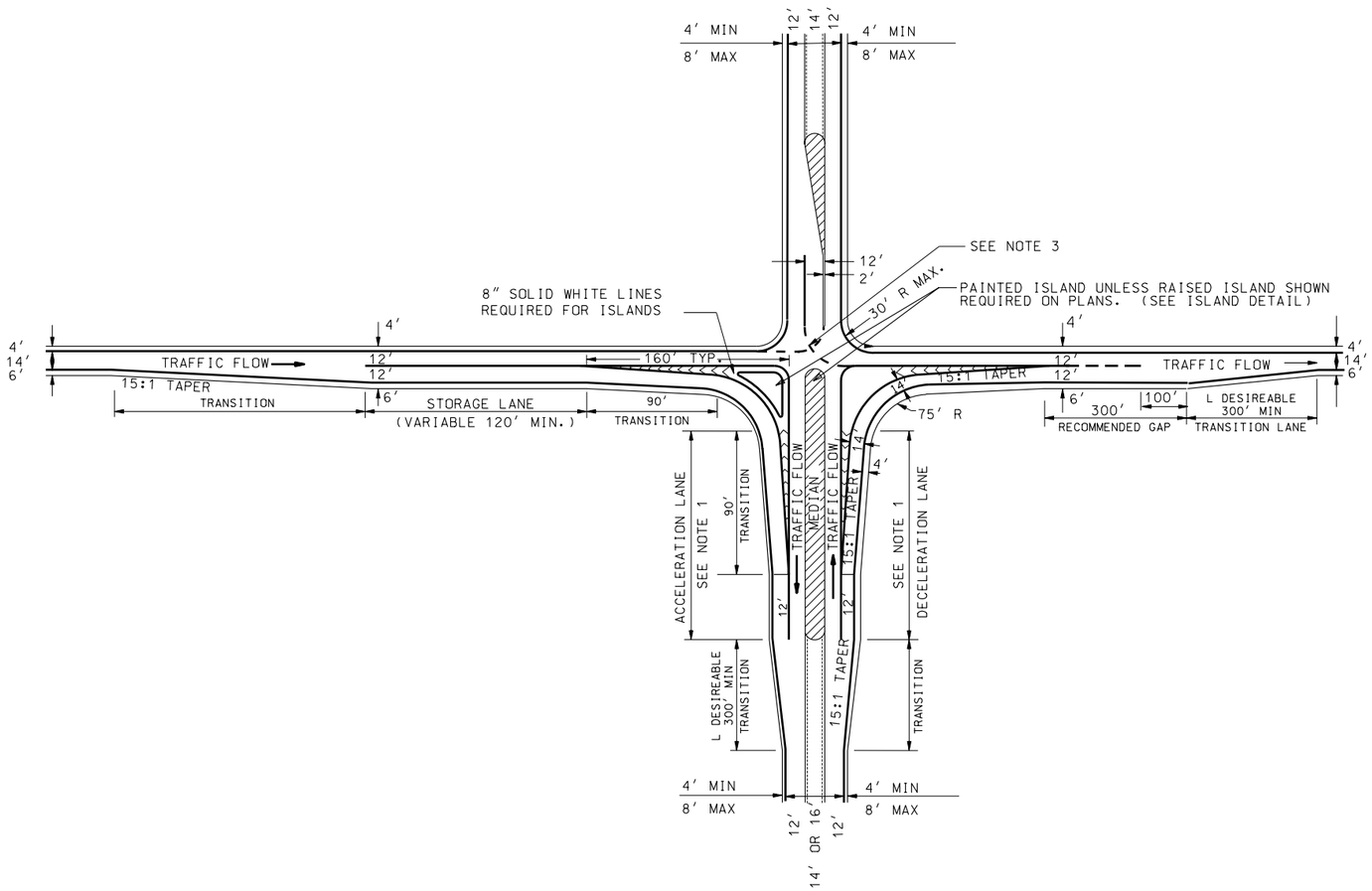
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

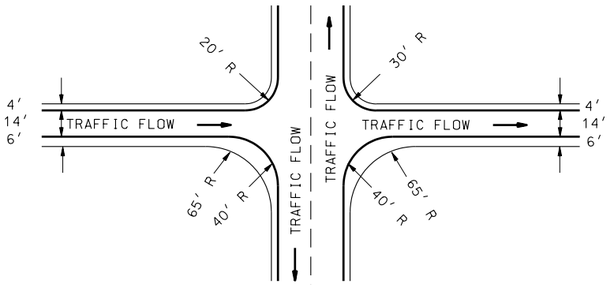
Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.



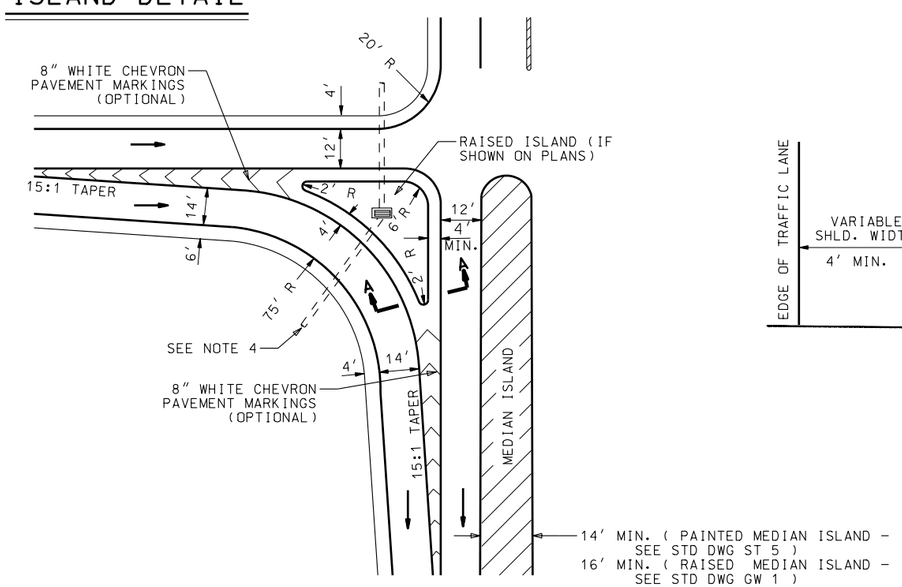
TYPE "A"



TYPE "B"

NOTE: TYPE "B" TO BE USED IN AREAS WITH LESS THAN 400 D.H.V.

ISLAND DETAIL



SECTION A-A

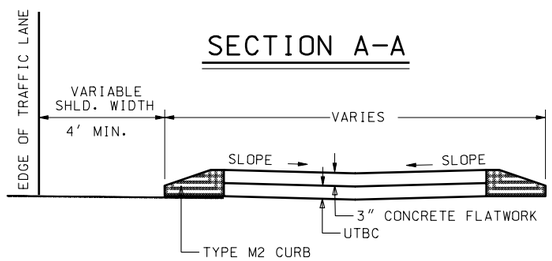


TABLE I	
SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	$L = WS$

WHERE:
- L = TAPER LENGTH IN FEET
- W = WIDTH OF OFFSET IN FEET
- S = SPEED IN MPH

NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS
3. USE WB-50 FOR TURNING RADIUS FOR LEFT TURNS
4. PROVIDE DRAINAGE FROM CATCH BASIN IN RAISED ISLAND AREA

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — DATE

DEPUTY DIRECTOR

(ENGLISH)

ENTRANCE & EXIT RAMP GEOMETRICS

STANDARD DRAWING TITLE

STD. DWG. NO.
DD 5

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Entrance and Exit Ramp Geometrics**
Specification/Drawing Number: **DD-6**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 825-1A.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about the call out for rumble strips in the gore area of the entrance ramp detail. The assignment was to review the call out. A review indicates this is not in conformance with PV-7, Rumble Strips Typical Detail. The detail note was deleted from the Drawing. An informational table was added for the L and D distances. These revisions were made to the Drawing. No other changes were made.

Priority Explanation

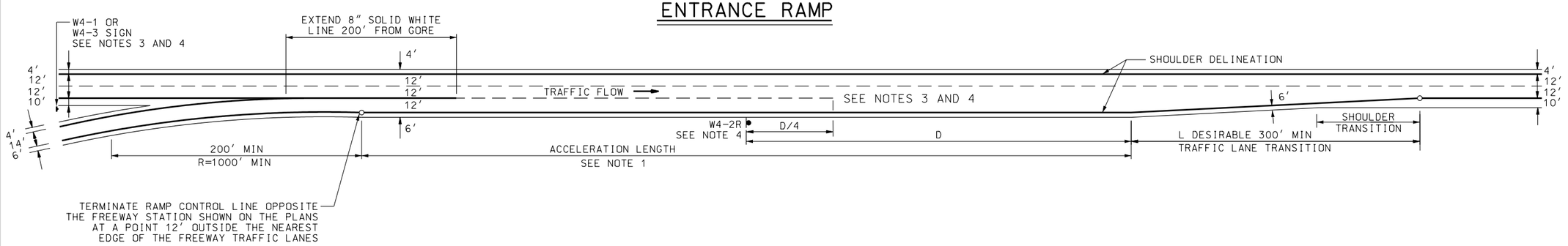
Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

ENTRANCE RAMP



EXIT RAMP

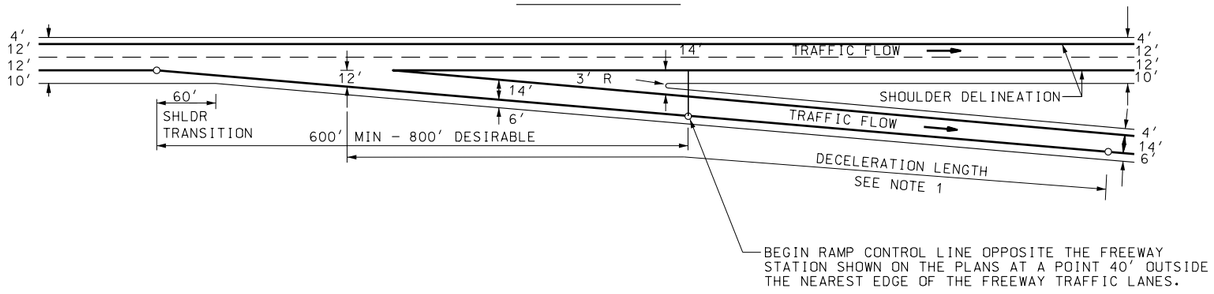


TABLE I		
SPEED MPH	L* FT	D FT
45	540	550
50	600	625
55	660	700
60	720	775
65	780	850
70	840	925
75	900	1000

* BASED ON 12' TRAFFIC LANE WIDTH

NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. USE MERGE SIGN (W4-1) WHEN TANGENT RAMP LENGTH IS EQUAL TO AASHTO ACCELERATION LENGTH.

   PLACE BROKEN LINE TO THE HALFWAY POINT OF THE AASHTO ACCELERATION LENGTH WHEN USING THE W4-1 SIGN.

   DO NOT USE LANE ENDS SIGN (W4-2) WHEN USING THE W4-1 SIGN.
4. USE ADDED LANE SIGN (W4-3) WHEN TANGENT RAMP LENGTH EXCEEDS THE AASHTO ACCELERATION LENGTH.

   PLACE BROKEN LINE AND DOTTED LINE AS PER STD DWG ST 3 WHEN USING THE W4-3 SIGN.

   PLACE LANE ENDS SIGN (W4-2) ONLY WHEN USING THE W4-3 SIGN.
5. SEE STD DWG ST 3 FOR PAVEMENT MARKINGS.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — DATE

DEPUTY DIRECTOR

(ENGLISH)

STANDARD DRAWING TITLE

ENTRANCE & EXIT RAMP GEOMETRICS

STD. DWG. NO.

DD 6

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Freeway Crossovers**
Specification/Drawing Number: **DD-7, GW-9, ST-2**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 805-3.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

   N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

   N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about the use of the Double Crossover detail. The issue was reviewed with Sterling Davis, Engineer for Maintenance, and he concurred with the Drawing as it was originally presented. It is being resubmitted with no major changes. One change is the clarification of the use of the radius for the crossover, and how to apply it to wide medians. This is addressed in Note 6.

Another modification was to bring consistency into terminology. Within the Drawing, both the term 'Turn-a-round' and 'Crossover' were used. After researching the AASHTO 2001 Green Book and consulting with Barry Axelrod, it was decided the proper term was 'Crossover'.

The Drawing was modified, as well as ST 02 and GW 09 to reflect the proper terminology.

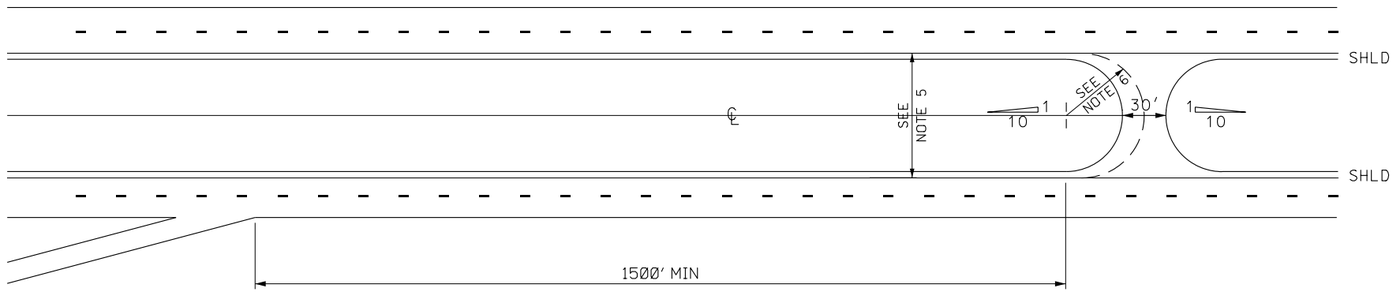
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

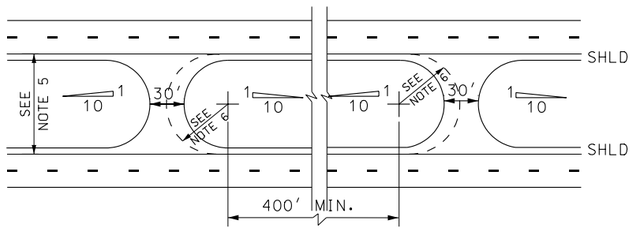
Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.



SINGLE CROSSOVER



DOUBLE CROSSOVER

SEE NOTE 13

NOTES:

1. USE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS
2. USE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS
3. PLACE CROSSOVER A MINIMUM OF 1500 FEET FROM RAMPS
4. SPACE CROSSOVERS A MINIMUM OF $2\frac{1}{2}$ MILES APART
5. USE CROSSOVERS WHERE MEDIAN WIDTH IS 36 FEET OR GREATER. REGION TRAFFIC ENGINEER APPROVAL REQUIRED FOR MEDIAN WIDTHS LESS THAN 36 FEET.
6. USE $\frac{1}{2}$ MEDIAN WIDTH AS CROSSOVER RADIUS, EXCEPT FOR MEDIANS WIDER THAN 130 FEET, THEN USE 65 FEET RADIUS MAXIMUM WITH CONNECTING TANGENT SECTION.
7. USE MINIMUM 10:1 SLOPE FOR APPROACHES TO CROSSOVER.
8. PROVIDE MINIMUM SIGHT DISTANCE FOR CROSSOVER LOCATIONS.
9. PLACE 'NO U-TURN-EXCEPT AUTHORIZED VEHICLES' SIGNING AND DELINEATION AT EACH CROSSOVER AS PER STD DWG ST 2.
10. CONSTRUCT THE MEDIAN CROSSOVER TO APPEAR INCONSPICUOUS BY FLATTENING OF SLOPES AND USING ROAD BASE OR SIMILAR MATERIAL FOR SURFACING.
11. PROVIDE MAINTENANCE CROSSOVERS AT LOCATIONS WHERE SNOW AND ICE REMOVAL WOULD BE SIGNIFICANTLY FACILITATED. LOCATIONS TO BE DETERMINED BY THE REGION TRAFFIC ENGINEER.
12. PROVIDE EMERGENCY VEHICLE CROSSOVERS OF THE TYPES SHOWN ON PLANS. LOCATIONS TO BE DETERMINED BY THE REGION TRAFFIC ENGINEER.
13. INSTALL DOUBLE CROSSOVERS AT MAINTENANCE STATION AREA BOUNDARIES. LOCATIONS TO BE DETERMINED BY THE REGION TRAFFIC ENGINEER.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL _____ DATE _____
DEPUTY DIRECTOR

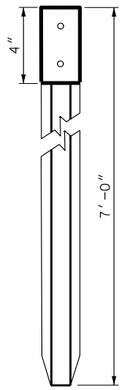
CHAIRMAN STANDARDS COMMITTEE
APPROVED _____ DATE _____

(ENGLISH)

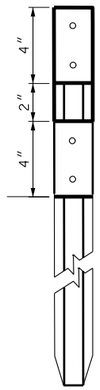
FREEWAY CROSSOVER

STANDARD DRAWING TITLE

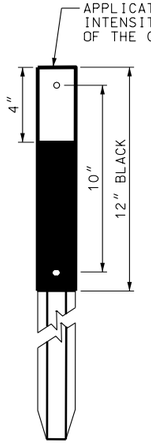
STD. DWG. NO.
DD 7



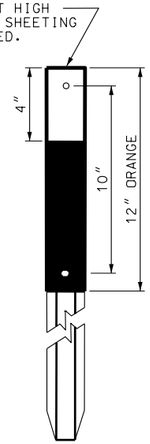
TYPE I
SINGLE UNIT
(OF COLOR SPECIFIED)
SEE NOTE 1



TYPE II
DOUBLE UNIT
SEE NOTE 1



CULVERT MARKER
SEE NOTE 2

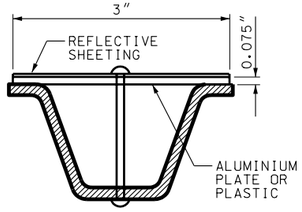


MAINTENANCE MARKER
SEE NOTE 2

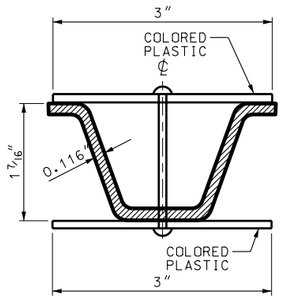
FREEWAY CROSSOVER MARKER
SEE NOTE 9

NOTES:

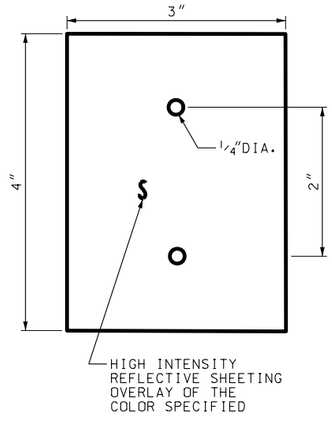
1. USE GALVANIZED STEEL POSTS FABRICATED WITH $^{5}/_{16}$″ HOLES ON 1″ SPACING. PUNCH HOLES ON THE CENTERLINE OF THE POST. PLACE TOP HOLE 1″ FROM THE TOP OF POST. PUNCH HOLES THE FULL LENGTH OF THE POST.
2. PAINT THE SPECIFIED COLOR OR ATTACH 3″ X 12″ X 1/10″ COLORED PLASTIC ON CULVERT AND MAINTENANCE MARKERS. USE BLACK ABOVE ORANGE WHEN BOTH MARKERS (MAINTENANCE AND CULVERT) ARE REQUIRED ON ONE DELINEATOR.
3. MOUNT BARRIER REFLECTORS ON CONCRETE AND BRIDGE PARAPETS WITH TWO $^{1}/_{4}$″ X $^{1}/_{4}$″ METAL HIT ANCHORS.
4. MOUNT BARRIER REFLECTORS ON CONCRETE BARRIER AS SHOWN ON STD DWG BA 2A.
5. MOUNT STRAIGHT REFLECTORS ON WOOD POSTS WITH TWO $2^{1}/_{2}$″ ELECTRO GALVANIZED RING SHANK NAILS WITH NEOPRENE WASHERS.
6. MOUNT STRAIGHT REFLECTORS ON STEEL POSTS WITH TWO $^{1}/_{4}$″ X $^{3}/_{4}$″ BOLTS AND SELF LOCKING NUTS.
7. MOUNT BARRIER REFLECTORS ON GUARDRAIL POSTS AS SHOWN ON STD DWG BA 4A.
8. INSTALL DELINEATOR PLATE ON THE SIDE OF THE POST FACING TRAFFIC. PREFERRED ORIENTATION OF POST TO ONCOMING TRAFFIC IS AS SHOWN. HOWEVER, EXISTING POST WITH THE OPPOSITE ORIENTATION IS ACCEPTABLE. INSTALL ON OPEN FACE SIDE WITH TWO $^{1}/_{4}$″ DIAMETER EXPANSION RIVETS (GRIP RANGE $1^{3}/_{8}$″ TO $1^{5}/_{8}$″). INSTALL ON OPPOSITE SIDE WITH TWO $^{1}/_{4}$″ POP RIVETS WITH BACKING WASHERS.
9. REFER TO STD DWG ST 2 FOR FREEWAY CROSSOVER DELINEATION MARKINGS AND HARDWARE.



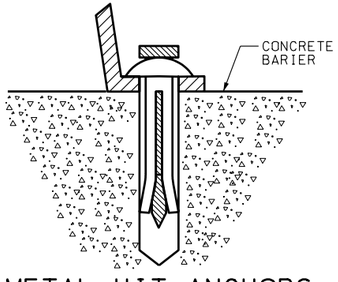
DELINEATOR INSTALLATION
SEE NOTE 8



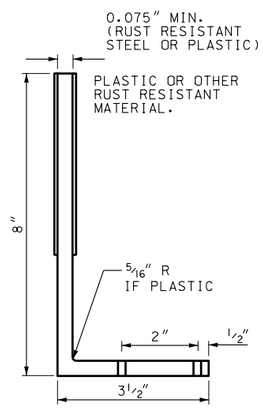
CULVERT/MAINTENANCE MARKER INSTALLATION
FOR 2 LB/FT POST WITH COLORED PLASTIC ATTACHED. SEE NOTE 2.



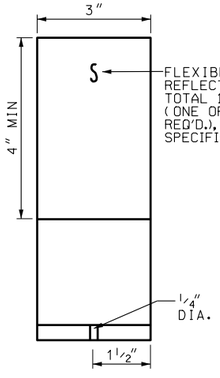
DELINEATOR PLATE
SEE NOTE 8

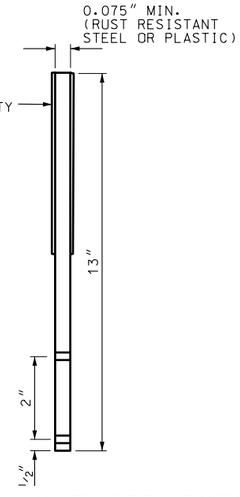


METAL HIT ANCHORS
SEE NOTE 3



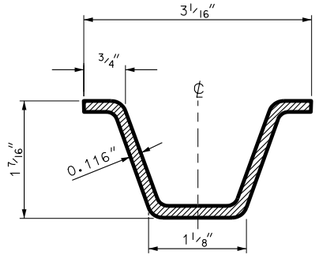
"L" REFLECTOR



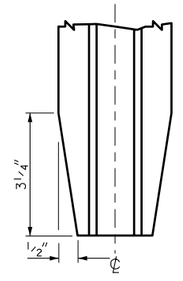


STRAIGHT REFLECTOR

BARRIER REFLECTORS
SEE NOTES 3, 4, 5, 6, 7



CROSS SECTION
FOR 2 LB/FT POST



POST TAPER DETAIL

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

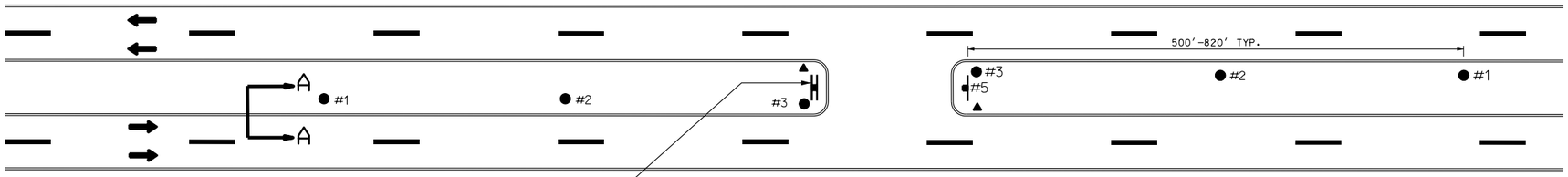
RECOMMENDED FOR APPROVAL — JULY 03,2002 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — JULY 03,2002 DATE

DEPUTY DIRECTOR

DELINEATION HARDWARE
STANDARD DRAWING TITLE

STD DWG
GW 9



FREEWAY CROSSOVER

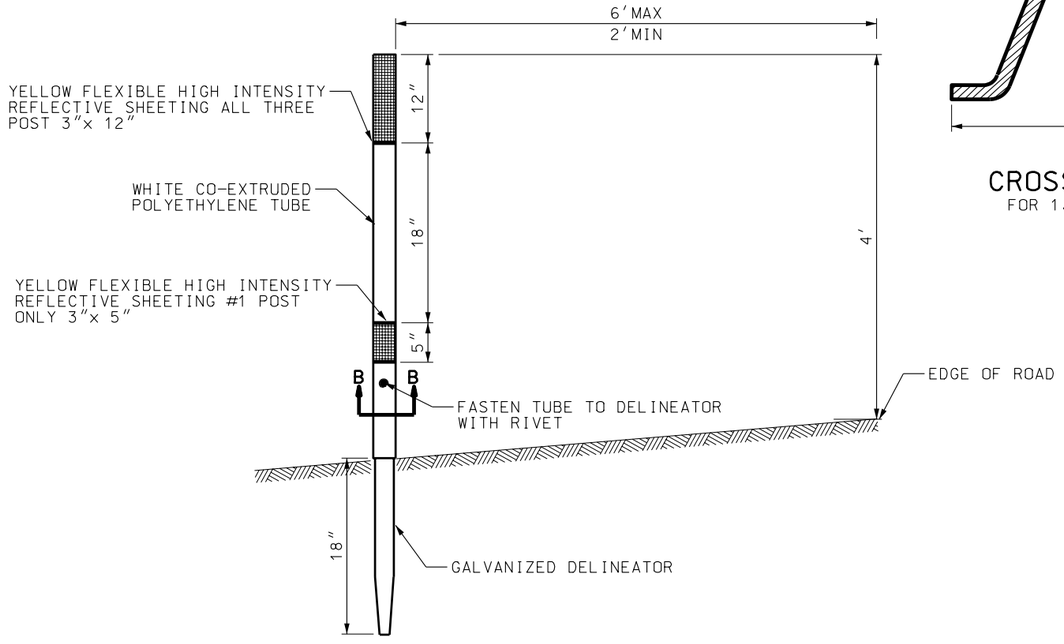
LEGEND

● = WHITE FLEXIBLE GUIDE POST

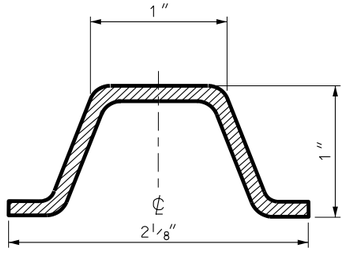
▲ = TYPE II DELINEATOR

30" X 48" BLK.R/W

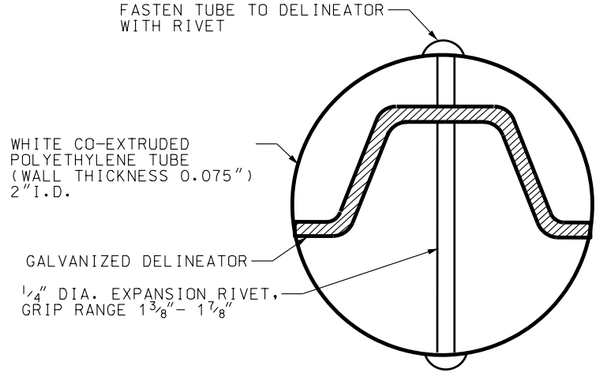
SIGN
R3-4



SECTION A-A



CROSS SECTION
FOR 1.2 LB/FT POST



SECTION B-B
SEE NOTES 2,3

NOTES:

1. USE EXISTING DELINEATOR SPACING WHEN POSSIBLE.
   POST #2 SPACED EVENLY BETWEEN POST #1 & #3
   POST #3 PLACE 10 FEET IN ADVANCE OF POINT OF TANGENCY.
2. USE GALVANIZED STEEL POST WITH 5/16" HOLES ON 1" SPACING, FULL LENGTH OF POST. ATTACH WHITE POLYETHYLENE TUBE WITH REFLECTIVE SHEETING AS SHOWN.
3. USE OTHER APPROPRIATE WHITE FLEXIBLE GUIDE POST UPON APPROVAL FROM ENGINEER FOR MAINTENANCE.
4. INSTALL TYPE II DELINEATOR AS SHOWN.
5. USE A SIGN AT EACH END OF CROSSING ADJACENT TO APPROACHING TRAFFIC WHERE THE MEDIAN IS SEPARATED BY MORE THAN 150 FEET.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — JULY 03,2002 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — JULY 03,2002 DATE

DEPUTY DIRECTOR

FREEWAY CROSSOVER MARKINGS

STANDARD DRAWING TITLE

STD DWG
ST 2

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Shoulders and Sidewalks on Urban Roadways**
Specification/Drawing Number: **GW-11**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 815-6.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about notes on the Drawing. The assignment was to explain the Notes. The first two notes are the same as all of the other old 800 Series---to alert the designer/constructor/maintainer of the Standards and Guides to be referenced. The third note, requiring a passing area on sidewalks of less than 5 feet, is an ADA requirement, and is provided for information purposes. It is currently and has been a requirement since the early 1990's. No changes were made.

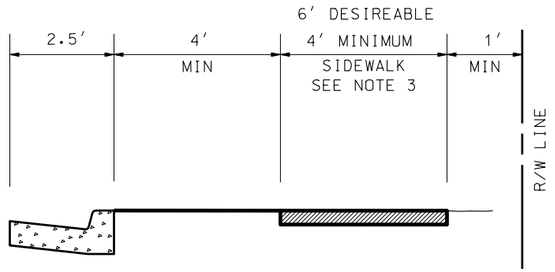
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

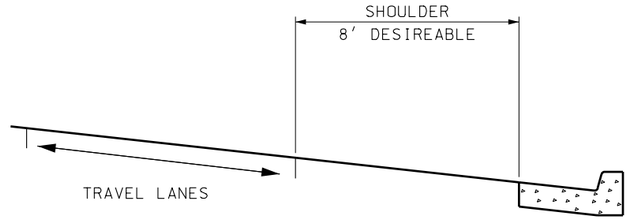
Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

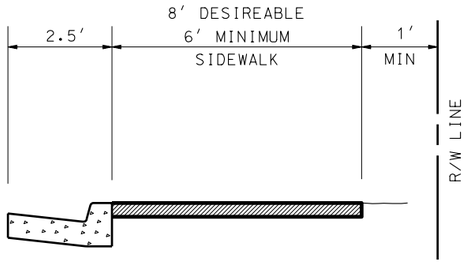
Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.



PARK STRIP



URBAN ROADWAY SHOULDERS



NO PARK STRIP

NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS
3. PROVIDE A 60 INCH x 60 INCH PASSING AREA ON SIDEWALKS OF LESS THAN 60 INCH WHEN THERE IS NOT A HARD SURFACE PASSING AREA OF 60 INCH MINIMUM WIDTH IN A 200 FOOT SEGMENT

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — DATE

DEPUTY DIRECTOR

(ENGLISH)

SIDEWALKS AND SHOULDERS ON URBAN ROADWAYS

STANDARD DRAWING TITLE

STD. DWG. NO.
GW 11

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Typical Rural 2 Lane Road With Median Lane and Deceleration Lane for Intersecting Crossroads**
Specification/Drawing Number: **DD-14**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Update, consolidation, and conversion of Old 800 Series Drawing 825-2.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This is the last Drawing of the 800 Series to be converted. The Drawing has been reviewed by the full Traffic Engineering Committee, and was approved as presented for submission to the Committee.

The Drawing has also been sent out for review to the list in Section C. At the time of this submission, there have been no comments yet received. Any additional comments received will be evaluated and either incorporated or addressed prior to the Standards Committee, and any changes will be presented.

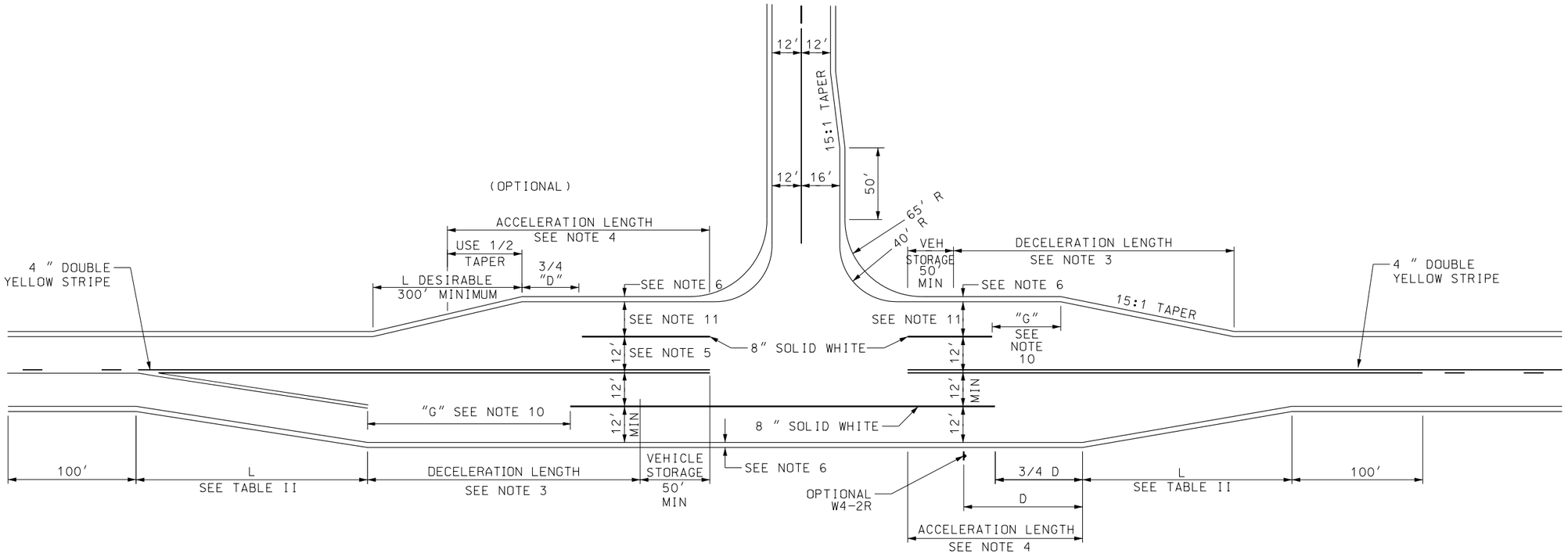
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, EXHIBIT 10-73 FOR DECELERATION LENGTH.

   USE A RUNNING SPEED OF 10 MPH BELOW POSTED SPEED LIMIT FOR ENTRANCE SPEED.

   USE EXHIBIT 10-71 FOR SPEED CHANGES ON GRADES.
4. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF STREETS AND HIGHWAYS EXHIBIT 10-70 FOR ACCELERATION LENGTH.

   USE A RUNNING SPEED OF 10 MPH BELOW POSED SPEED LIMIT FOR MERGING SPEED.

   USE EXHIBIT 10-71 FOR SPEED CHANGES ON GRADES.
5. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER IF ACCELERATION LANE IS NOT USED.
6. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
7. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
8. PROVIDE LEFT TURN POCKET ON OPPOSITE APPROACH FOR A FOUR LEG INTERSECTION.
9. PROVIDE LEFT TURN LANE, RIGHT TURN DECELERATION LANE, RIGHT TURN ACCELERATION LANE, AND/OR LEFT TURN ACCELERATION LANE WHEN VOLUMES EXCEED THOSE LISTED IN TABLE I. INCREASE THE VOLUMES TO PROVIDE PASSENGER CAR EQUIVALENTS FOR TRUCKS.
10. G = 90′ FOR SPEEDS 40 MPH AND BELOW
    G = 140′ FOR SPEEDS 45 TO 50 MPH
    G = 180′ FOR SPEEDS 55 MPH AND ABOVE
11. 12′ LANE WIDTH DESIRABLE
    10′ MINIMUM LOW VOLUME LOW SPEED.
12. SEE STD DWG ST 5 FOR INFORMATION ON SIGNING AND STRIPING DETAILS.

TABLE I

MINIMUM LEVELS FOR INSTALLATION OF TURN AND ACCELERATION LANES ON RURAL TWO LANE ROADS

SPEED	LEFT TURN LANE	RIGHT TURN LANE	RIGHT TURN ACCELERATION LANE	LEFT TURN ACCELERATION LANE
40 MPH AND LESS	25 VPH	50 VPH	OPTIONAL	OPTIONAL
45 TO 55 MPH	10 VPH	25 VPH	50 VPH	**
60 MPH AND GREATER	REQ'D*	10 VPH	25 VPH	***

* FARM ACCESSES EXCLUDED.
** OPTIONAL FOR 50 MPH AND LESS. FOR 55 MPH, AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
*** AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER CAR EQUIVALENTS.

TABLE II

SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	L= WS

WHERE:
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH

"D" DISTANCE

SPEED MPH	"D" FEET	3/4 "D" FEET
25	250	190
30	325	245
35	400	300
40	475	360
45	550	415
50	625	470
55	700	525
60	775	585
65	850	640

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — DATE
DEPUTY DIRECTOR

(ENGLISH)
TYPICAL RURAL 2 LANE ROAD WITH MEDIAN LANE AND DECELERATION LANE FOR INTERSECTING CROSSROADS

STANDARD DRAWING TITLE

STD. DWG. NO.
DD 14

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Delineation Application**
Specification/Drawing Number: **GW-10**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Clarification of the use of Delineation on entrance and exit ramps. Specifically, responding to a request from Maintenance to have delineation placed on these ramps to aid in snow removal. Currently, these delineators are not required, and are not being included in projects. They are either added as a change order on the project, or the responsible Station installs them after project acceptance. The Drawing was also reviewed for conformance with the MUTCD.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Additional delineators are placed on each ramp, spaced 100 feet apart. On a ramp, depending on the length, there may be 9 additional delineators per side. The additional delineators will be more than offset by the reduction in the total number of delineators that will be on the system. The previous Drawing allowed a maximum spacing of 400 feet on tangent for delineation. We are proposing to bring the Drawing in compliance with the MUTCD and allow a maximum spacing of 528 feet on tangent.

3. Life cycle cost.

N/A

E. Safety Impacts?

Provide delineation where there is not presently any.

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

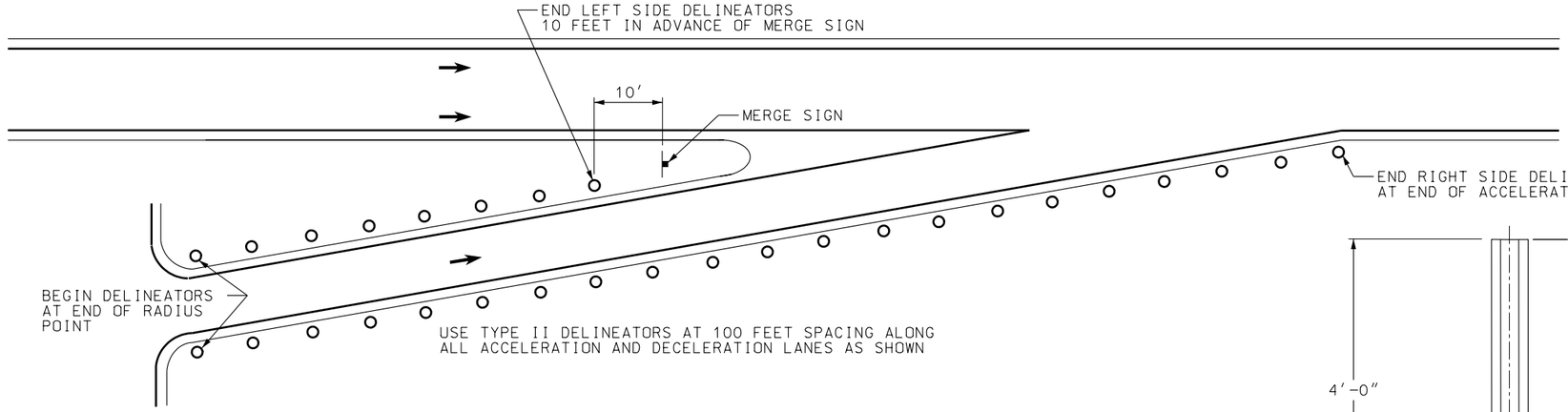
This Drawing received comments during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. The Drawing was modified or the comments addressed each time. At the June '03 Committee meeting, a question was raised about additional delineators on the entrance and exit ramps, which was the primary motivation for changing the drawing.. The assignment was to review the Drawing with Sterling Davis. Sterling concurs with the Drawing. The only change to the Drawing was to clarify Note 4. No other changes were made.

Priority Explanation

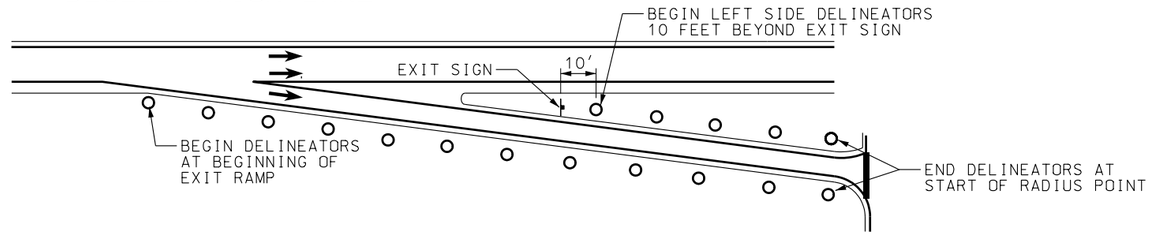
Enter the appropriate priority in the box on the first page of the document.

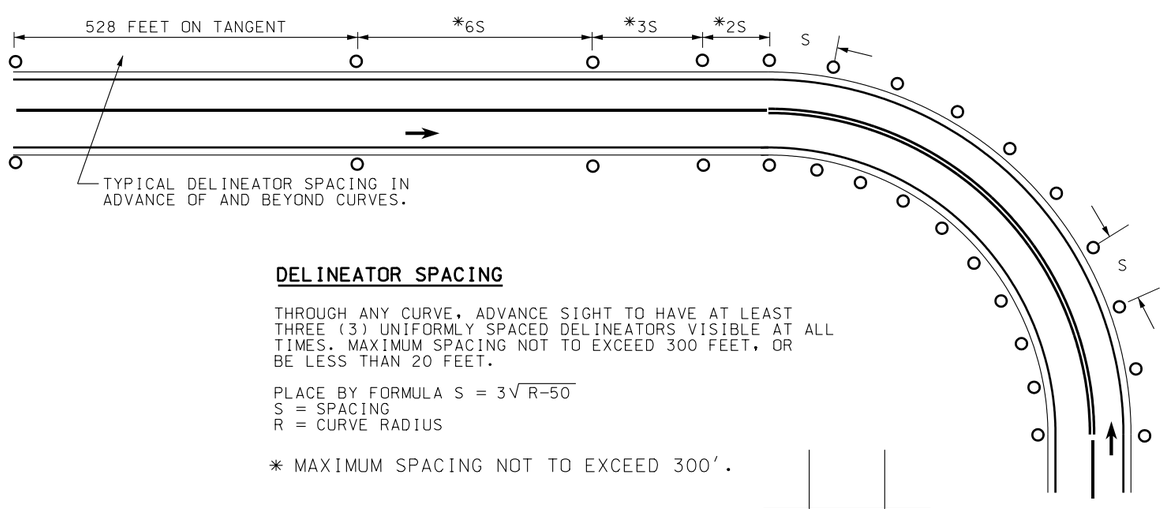
Priority 1	Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
Priority 2	Upon posting, this impacts projects being advertised.
Priority 3	Upon posting, the approved standard takes effect two weeks later for projects being advertised.

ACCELERATION LANE



DECELERATION LANE



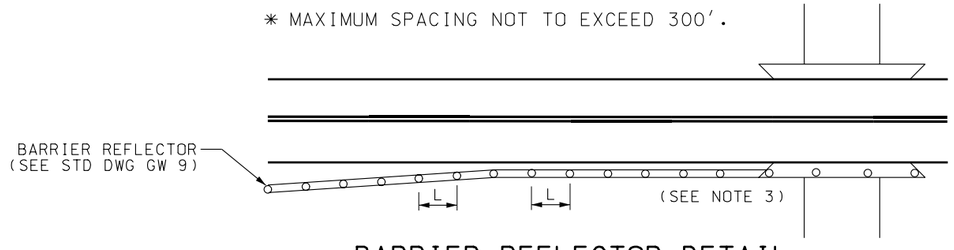


DELINEATOR SPACING

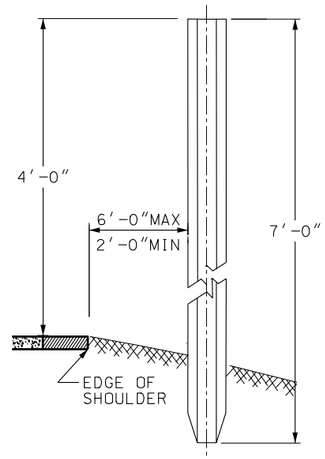
THROUGH ANY CURVE, ADVANCE SIGHT TO HAVE AT LEAST THREE (3) UNIFORMLY SPACED DELINEATORS VISIBLE AT ALL TIMES. MAXIMUM SPACING NOT TO EXCEED 300 FEET, OR BE LESS THAN 20 FEET.

PLACE BY FORMULA $S = 3\sqrt{R-50}$
S = SPACING
R = CURVE RADIUS

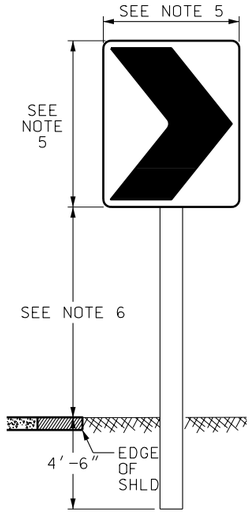
* MAXIMUM SPACING NOT TO EXCEED 300′.



BARRIER REFLECTOR DETAIL
(SEE NOTE 2)



DELINEATOR



CHEVRON ALIGNMENT SIGN

NOTES:

1. BARRIERS ARE DEFINED AS BEING GUARDRAIL,CONCRETE BARRIER & BRIDGE PARAPET WALL.
2. MOUNT BARRIER REFLECTORS ON ENTIRE LENGTH OF BARRIER AS PER BARRIER TYPE STANDARD.

   USE REFLECTOR SPACING (L) OF 50 FEET IN PERMANENT LOCATIONS, AND 25 FEET FOR TEMPORARY SITUATIONS.

   USE REFLECTOR COLOR TO MATCH THE ADJACENT PAINT STRIPE.
3. IF GUARDRAIL IS NOT ATTACHED TO PARRAPET, INSTALL APPROPRIATE OBJECT MARKER OM-3R (OR L OR C) IN PLACE OF DELINEATOR AT LEADING EDGE OF BRIDGE PARAPET.
4. CHEVRON ALIGNMENT (W1-8) SIGNS MAY BE USED WHEN ADDITIONAL EMPHASIS AND GUIDANCE FOR A CHANGE IN HORIZONTAL ALIGNMENT IS NEEDED. THE W1-8 SIGN MAY BE USED TO SUPPLEMENT STANDARD DELINEATORS ON CURVES. THE W1-8 SIGN MAY BE USED TO SUPPLEMENT OR AS AN ALTERNATE TO THE LARGE ARROW (W1-6) SIGN.

   WHEN USED, INSTALL THE W1-8 SIGNS ON THE OUTSIDE OF A TURN OR CURVE, IN LINE WITH, AND AT APPROXIMATELY A RIGHT ANGLE TO APPROACHING TRAFFIC.

   THE W1-8 SIGN SHOULD BE VISIBLE FOR A SUFFICIENT DISTANCE TO PROVIDE THE ROAD USER WITH ADEQUATE TIME TO REACT TO THE CHANGE IN ALIGNMENT. SPACE THE SIGNS SUCH THAT THE ROAD USER ALWAYS HAS AT LEAST TWO SIGNS IN THEIR VIEW UNTIL THE CHANGE OF ALIGNMENT ELIMINATES THE NEED FOR A SIGN.
5. USE W1-8 SIGN SIZE AS FOLLOWS:

   a) FOR CONVENTIONAL ROADS USE 24″ X 30″.
   b) FOR EXPRESSWAYS USE 30″X 36″.
   c) FOR FREEWAYS USE 36″ X 48″.
6. USE 7′ MIN, 7′6″ MAX MOUNTING HEIGHT ON INTERSTATE, EXPRESSWAY, AND URBAN AREAS. USE 5′ MIN, 7′6″ MAX IN RURAL AREAS.
7. USE CONSISTENT MOUNTING HEIGHT AT EACH LOCATION.

REVISIONS			
NO.	DATE	APPR.	REMARKS
1	02/11/03	T.T.	REVISED ENTIRE DRAWING

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — FEB.27, 2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — FEB.27, 2003 DATE

DEPUTY DIRECTOR

STANDARD DRAWING TITLE

DELINEATION APPLICATION

STD DWG
GW 10

DGN File: J:\Standards\MeetingFiles\August28,03Mtg\FromJohn\GW10.dgn
11-AUG-2003

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Traffic Control Single Lane Closure Moving Intermittent Operation**
Specification/Drawing Number: **TC-17 (New)**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

There have been many requests from Maintenance, Permits, and Construction for a drawing detailing how to design and implement a moving operation on freeways. Traffic and Safety has taken the lead and developed this Drawing to address the desires of our customers. This Drawing highlights the application from the MUTCD, and provides the flexibility needed for using the operation on the State system.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily maintenance, construction, and permits. Preconstruction and design are also customers when the design is desired to be used in a project.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

If full option is used, it will require one more vehicle with an arrow panel per lane. However, the Drawing provides the option of not using this vehicle, which would result in no additional cost.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

If full option is used, it will require one more vehicle with an arrow panel per lane. However, the Drawing provides the option of not using this vehicle, which would result in no additional equipment.

3. Life cycle cost.

N/A

E. Safety Impacts?

It will standardize the usage of a moving operation on the freeway system, and meets the expectancy of the motorist to see the same operation anywhere in the state. This increases the safety of the workers doing the operation, since the motorist is not surprised and behaves in a predictable manner.

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing did not have any substantial comments (ie—only spelling, etc) during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. At the June '03 Committee meeting, a question was raised about the required use of the vehicle in the center of the operation. The issue was reviewed, and the use of this vehicle is now optional upon the approval of the Region Traffic Engineer.

Priority Explanation

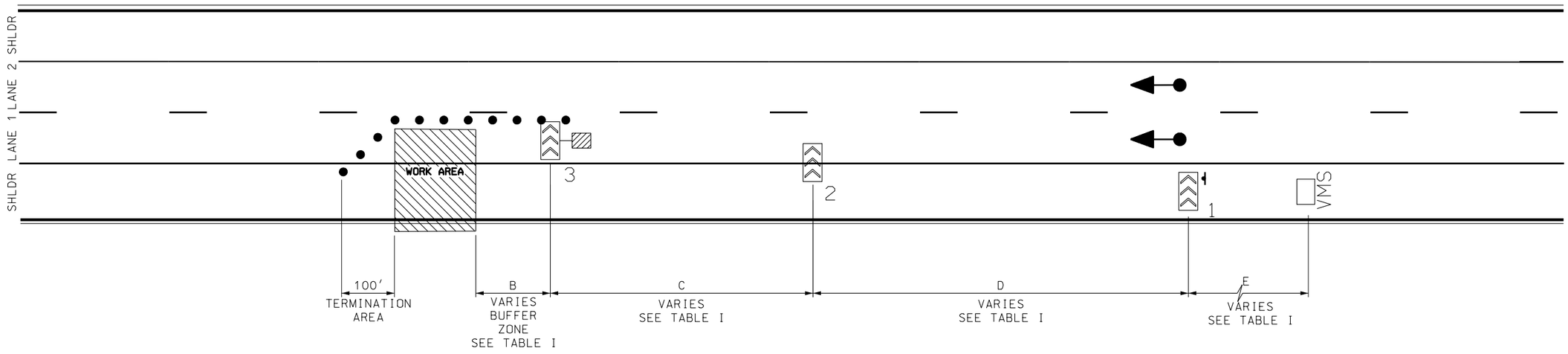
Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

SINGLE LANE MOVING/INTERMITTANT OPERATION FOR MULTI-LANE HIGHWAYS OF 2 OR MORE LANES WITH STOP DURATION OF LESS THAN 1 HOUR



SPACING REQUIREMENTS				
TABLE I				
SPEED MPH	B** FT	C* FT	D FT	E FT
≤40	100	160	300	200- 500
45	110	270	400	500-1000
50	140	300	450	500-1000
55	170	330	500	500-1000
60	210	360	500	1000-1500
65	250	390	500	1000-1500
70	300	420	500	1000-1500
75	350	450	500	1000-1500

* BASED ON 12' TRAFFIC LANE WIDTH
** 1/2 BUFFER ZONE REQUIREMENT, STD DWG TC 2B

NOTES:

1. ALL VEHICLES TO HAVE ARROW PANELS SET TO LANE CLOSURE ARROW.
2. TRUCK MOUNTED ATTENUATOR REQUIRED ON VEHICLE #3. OPTIONAL ON VEHICLES #1 AND #2. SEE NOTE 10 FOR SPECIAL CONDITIONS ON VEHICLE #1.
3. DURATION AT ANY ONE LOCATION NOT TO EXCEED 1 HOUR.
4. PROVIDE ADVANCE ROAD CONSTRUCTION NOTIFICATION BY PLACING PORTABLE VMS IN ADVANCE OF VEHICLE #1, PLACED ON SHOULDER.
5. PLACE ADVANCE SIGNING ON ALL RAMPS BETWEEN VEHICLE #1 AND PORTABLE VMS.
6. USE ATMS VMS SIGNS FOR ADVANCE WARNING/NOTIFICATION WHEN AVAILABLE.
7. USE STD DWG TC 18 FOR OPERATIONS REQUIRING TWO OR MORE LANES.
8. MAY BE USED FROM EITHER LEFT OR RIGHT SHOULDER.
9. VEHICLE #2 OPIONAL ON HIGHWAYS WITH SPEEDS OF 40 MPH AND LESS. FOR SPEEDS OF 45 MPH AND GREATER, VEHICLE #2 MAY BE OMITTED UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.
10. VEHICLE #2 NOT USED ON HIGHWAYS WITH SHOULDERS LESS THAN 6 FEET WIDE, WITH VEHICLE #1 PARTIALLY IN THE TRAVEL LANE. TRUCK MOUNTED ATTENUATOR REQUIRED.
11. WHEN VEHICLE #2 IS NOT USED, REDUCE THE SPACING BETWEEN VEHICLES #1 AND #3 TO TWICE DISTANCE "C".

LEGEND

- CHANNELIZATION DEVICE
- DIRECTION OF TRAFFIC
- ARROW PANEL
- TRUCK MOUNTED ATTENUATOR (TMA)
- VARIABLE MESSAGE SIGN (VMS)

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL _____ DATE _____
DEPUTY DIRECTOR

CHAIRMAN STANDARDS COMMITTEE
APPROVED _____ DATE _____

TRAFFIC CONTROL
SINGLE LANE CLOSURE
MOVING/INTERMITTENT
OPERATION

STANDARD DRAWING TITLE

STD DWG
TC 17

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Traffic Control Multiane Closure Moving Intermittent Operation**
Specification/Drawing Number: **TC-18 (New)**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

There have been many requests from Maintenance, Permits, and Construction for a drawing detailing how to design and implement a moving operation on freeways. Traffic and Safety has taken the lead and developed this Drawing to address the desires of our customers. This Drawing highlights the application from the MUTCD, and provides the flexibility needed for using the operation on the State system.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily maintenance, construction, and permits. Preconstruction and design are also customers when the design is desired to be used in a project.

Contacted Staff include:

Barry Axelrod, Boyd Wheeler, David Eixenberger, Eric Cheng, Farrell Wright, Howard Anderson, Jason Davis, Larry Montoya, Murari Pradhan, Peter Negus, Robert Hull, Richard Clarke, Richard Miller, Sterling Davis, Robert Clayton, Steven Anderson, Zeke Gonzalez, Brent DeYoung, Darin Duersch, Daniel Erikson, John Gunderson, Kevin Griffin, Rex Harris, Betty Purdie, Ed Rock, Joe Kammerer, Mack Christensen, Shana Lindsey, Brian Phillips, Brent Schvaneveldt, Doug Bassett, Degen Lewis, James Cox, Merrell Jolley, Clark Mackay, Gaye Babcock, Ross Christensen, Robert Dowell, Scott Munson, Troy Torgersen, Chris Siavrakas, Ritchie Taylor, Tam Southwick, and Scott Jones.

Construction Engineers

Central Deputy Construction Engineer Pete Negus

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

If full option is used, it will require one more vehicle with an arrow panel per lane. However, the Drawing provides the option of not using this vehicle, which would result in no additional cost.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

If full option is used, it will require one more vehicle with an arrow panel per lane. However, the Drawing provides the option of not using this vehicle, which would result in no additional equipment.

3. Life cycle cost.

N/A

E. Safety Impacts?

It will standardize the usage of a moving operation on the freeway system, and meets the expectancy of the motorist to see the same operation anywhere in the state. This increases the safety of the workers doing the operation, since the motorist is not surprised and behaves in a predictable manner.

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing did not have any substantial comments (ie—only spelling, etc) during the three times it was sent out for review to the list in Section C prior to the final submission to the Committee. At the June '03 Committee meeting, a question was raised about the required use of the vehicle in the center of each lane in the operation. The issue was reviewed, and the use of this vehicle is now optional upon the approval of the Region Traffic Engineer.

Priority Explanation

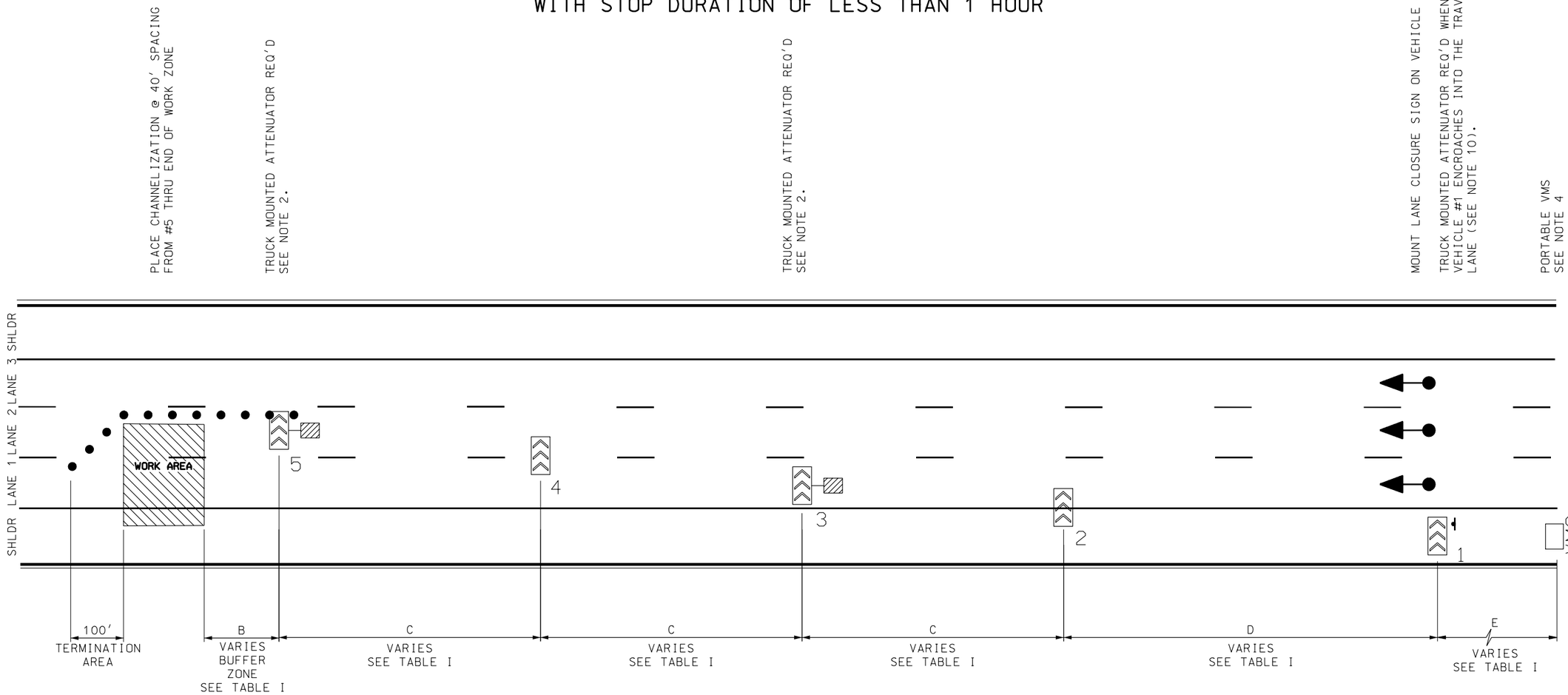
Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

TWO LANE MOVING/INTERMITTANT OPERATION FOR MULTI-LANE HIGHWAYS OF 3 OR MORE LANES WITH STOP DURATION OF LESS THAN 1 HOUR



SPACING REQUIREMENTS				
TABLE I				
SPEED MPH	B** FT	C* FT	D FT	E FT
≤40	100	160	300	200- 500
45	110	270	400	500-1000
50	140	300	450	500-1000
55	170	330	500	500-1000
60	210	360	500	1000-1500
65	250	390	500	1000-1500
70	300	420	500	1000-1500
75	350	450	500	1000-1500

* BASED ON 12' TRAFFIC LANE WIDTH
** 1/2 BUFFER ZONE REQUIREMENT, STD DWG TC 2B

NOTES:

1. ALL VEHICLES TO HAVE ARROW PANELS SET TO LANE CLOSURE ARROW.
2. TRUCK MOUNTED ATTENUATOR REQUIRED ON VEHICLES #3 AND #5. OPTIONAL ON VEHICLES #1, #2, AND #4. SEE NOTE 10 FOR SPECIAL CONDITIONS ON VEHICLE #1.
3. DURATION AT ANY ONE LOCATION NOT TO EXCEED 1 HOUR.
4. PROVIDE ADVANCE ROAD CONSTRUCTION NOTIFICATION BY PLACING PORTABLE VMS IN ADVANCE OF VEHICLE #1, PLACED ON SHOULDER.
5. PLACE ADVANCE SIGNING ON ALL RAMPS BETWEEN VEHICLE #1 AND PORTABLE VMS.
6. USE ATMS VMS SIGNS FOR ADVANCE WARNING/NOTIFICATION WHEN AVAILABLE.
7. CLOSURE OF MORE THAN TWO LANES REQUIRES 2 ADDITIONAL ARROW PANELS PER LANE, ONE STRADDLING THE LANE AND ONE IN THE CLOSED LANE WITH A TMA. REGION TRAFFIC ENGINEER APPROVAL REQUIRED.
8. MAY BE USED FROM EITHER LEFT OR RIGHT SHOULDER.
9. VEHICLES #2 AND #4 OPTIONAL ON HIGHWAYS WITH SPEEDS OF 40 MPH AND LESS. FOR SPEEDS OF 45 MPH AND GREATER, VEHICLES #2 AND/OR #4 MAY BE OMITTED UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.
10. VEHICLE #2 NOT USED ON HIGHWAYS WITH SHOULDERS LESS THAN 6 FEET WIDE, WITH VEHICLE #1 PARTIALLY IN THE TRAVEL LANE. TRUCK MOUNTED ATTENUATOR REQUIRED.
11. WHEN VEHICLE #2 IS NOT USED, REDUCE THE SPACING BETWEEN VEHICLES #1 AND #3 TO TWICE DISTANCE "C". WHEN VEHICLE #4 IS NOT USED, THE SPACING BETWEEN VEHICLES #3 AND #5 REMAINS TWICE DISTANCE "C".

LEGEND

- CHANNELIZATION DEVICE
- DIRECTION OF TRAFFIC
- ARROW PANEL
- TRUCK MOUNTED ATTENUATOR (TMA)
- VARIABLE MESSAGE SIGN (VMS)

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE
CHAIRMAN STANDARDS COMMITTEE — DATE
APPROVED
DEPUTY DIRECTOR

TRAFFIC CONTROL
MULTILANE CLOSURE
MOVING/INTERMITTENT
OPERATION

STANDARD DRAWING TITLE

STD DWG
TC 18

Standard Committee Submittal Sheet

Name of preparer: **John Leonard**
Title/Position of preparer: **Operations Engineer**
Specification/Drawing/Item Title: **Speed Reduction Sign Sequence (New Drawing)**
Specification/Drawing Number: **SN-6, SN-6A**
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Standardization of the sequence of the signs reducing posted speed on highways, usually approaching communities. This is very similar to the current signing approach. The Traffic Engineering Panel is the sponsor of this Drawing.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Primarily design, preconstruction, maintenance, and construction.

Traffic and Safety is the lead in this Drawing. The information in this Drawing is currently being handled by the Traffic Engineers in the Regions. The centralization of the information provides one location that is readily available, including through the internet. Some of the users of this Drawing will not be UDOT driven, but will be Cities and Counties. The availability of this information in one place will facilitate helping both our internal and external customers as well.

Construction Engineers

N/A

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) participated in the review and development of this Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

E. Safety Impacts?

N/A

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This Drawing will standardize the application of the speed reduction sequence. Note that two Drawings are being submitted. SN-6 uses the current MUTCD signs (R2-5a and R2-5b) for speed reduction. However, the Notice of Proposed Amendment (NPA) No. 2 to the MUTCD is in final rulemaking, and will be published in early October. The second Drawing SN-6A, uses the signs that are proposed in the NPA. Specifically, the current signs used are regulatory, when in reality they are warning signs. The new proposed signs are warning signs. It is also proposed to delete the old regulatory signs from the manual. Distances and usage are the same—the only differences in the Drawings are the regulatory v. warning signs for the approach. We request that the Committee consider both Drawings as one submittal, with approval conditional on the signs that will be approved by the MUTCD. That one would be the Drawing published as SN-6.

Priority Explanation

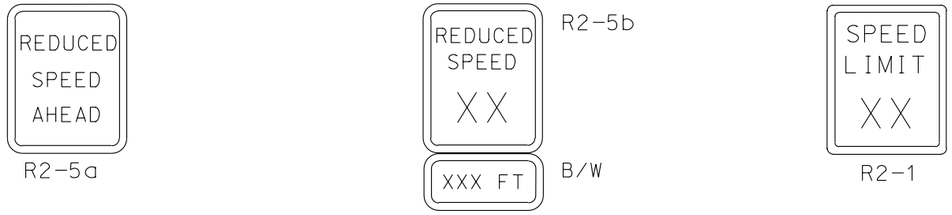
Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

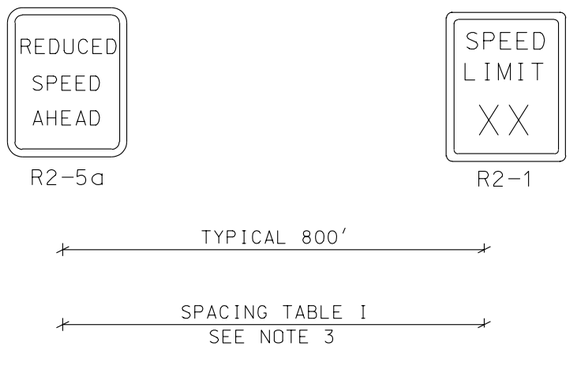
Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

FOR REDUCTION OF 20 MPH OR GREATER



FOR REDUCTION OF 15 MPH (SEE NOTE 4)



FOR REDUCTION 10 MPH OR LESS (OPTIONAL)

NOTES:

1. USE MINIMUM SIGN SIZE OF 36 INCHES x 48 INCHES FOR CONVENTIONAL ROADS AND EXPRESSWAYS.

   USE SIGN SIZE OF 48 INCHES x 60 INCHES FOR FREEWAYS.

   USE SAME SIZES FOR BOTH THE R2-1 AND THE R2-5a SIGNS.

2. USE 800 FEET TYPICAL SIGN SPACING.

3. USE TABLE I FOR OPTIONAL SIGN SPACING UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.

4. USE OF THREE SIGN SEQUENCE OPTIONAL FOR SPEED REDUCTION OF 15 MPH.

TABLE I

REDUCED SPEED (MPH) \ APPROACH SPEED MPH	75	70	65	60	55	50	45	40	35	30
70	470									
65	790	430								
60	1080	720	390							
55	1360	1000	660	350						
50	1620	1250	910	600	310					
45	1830	1470	1140	820	540	270				
40	2040	1670	1340	1030	740	470	230			
35	2220	1850	1520	1200	920	650	410	200		
30	2380	2000	1670	1360	1070	810	570	350	160	
25	2520	2140	1800	1490	1200	940	700	480	290	120
20	2630	2240	1910	1600	1310	1040	800	590	390	230
15	2720	2320	1990	1680	1390	1130	890	670	480	310

SOURCE: TRAFFIC CONTROL DEVICES HANDBOOK 2001

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/11/03	T.T.	REVISED ENTIRE DRAWING

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — FEB.27, 2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — FEB.27, 2003 DATE

DEPUTY DIRECTOR

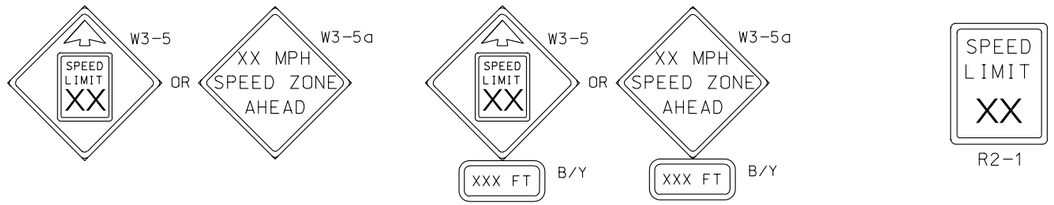
STANDARD DRAWING TITLE

SPEED REDUCTION SIGN SEQUENCE

STD DWG
SN 6

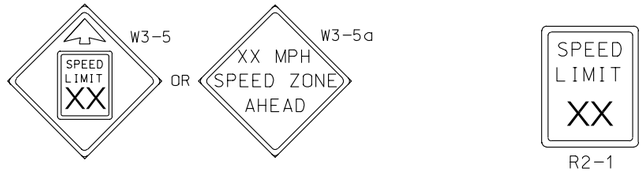
DGN File:J:\Standards\MeetingFiles\August28,03Mtg\FromJohn\SN06.dgn
11-AUG-2003

FOR REDUCTION OF 20 MPH OR GREATER



FOR REDUCTION OF 15 MPH (SEE NOTE 4)

FOR REDUCTION 10 MPH OR LESS (OPTIONAL)



NOTES:

1. USE MINIMUM R2-1 SIGN SIZE OF 36 INCHES x 48 INCHES FOR CONVENTIONAL ROADS AND EXPRESSWAYS.

   USE R2-1 SIGN SIZE OF 48 INCHES x 60 INCHES FOR FREEWAYS.

   USE W3-5 (OR W3-5a) SIGN SIZE OF 48 INCHES x 48 INCHES.

2. USE 800 FEET TYPICAL SIGN SPACING.

3. USE TABLE I FOR OPTIONAL SIGN SPACING UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.

4. USE OF THREE SIGN SEQUENCE OPTIONAL FOR SPEED REDUCTION OF 15 MPH.

TABLE I

REDUCED SPEED (MPH) \ MINIMUM SPEED SIGNING PLACEMENT APPROACH SPEED MPH	75	70	65	60	55	50	45	40	35	30
70	470									
65	790	430								
60	1080	720	390							
55	1360	1000	660	350						
50	1620	1250	910	600	310					
45	1830	1470	1140	820	540	270				
40	2040	1670	1340	1030	740	470	230			
35	2220	1850	1520	1200	920	650	410	200		
30	2380	2000	1670	1360	1070	810	570	350	160	
25	2520	2140	1800	1490	1200	940	700	480	290	120
20	2630	2240	1910	1600	1310	1040	800	590	390	230
15	2720	2320	1990	1680	1390	1130	890	670	480	310

SOURCE: TRAFFIC CONTROL DEVICES HANDBOOK 2001

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/11/03	T.T.	REVISED ENTIRE DRAWING

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — FEB.27,2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — FEB.27,2003 DATE

DEPUTY DIRECTOR

STANDARD DRAWING TITLE
SPEED REDUCTION SIGN SEQUENCE

STD DWG
SN 6A

DGN File: J:\Standards\MeetingFiles\August28_03\Mkg\From_John\SN06A.dgn
11-AUG-2003

Standard Committee Submittal Sheet

Name of preparer: John Leonard
Title/Position of preparer: Operations Engineer
Specification/Drawing/Item Title: School Crossing and School Message
Specification/Drawing Number: ST-9 (New)
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The Supplement to Part 7 of the MUTCD, Traffic Controls for School Zones, is being updated, and is currently in the Rule Making Process. The Supplement is required in Utah Code, Section 41-6-20. This Drawing combines the School Crosswalk from ST-4 along with the use of the ‘SCHOOL’ message into one central location, which is referenced by the Supplement. Information presented is not a change, just more detail for installation practices. ST-4 is in the process of being reviewed, and will be presented to the Committee in the October ’03 cycle.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Traffic and Safety is the lead in this Drawing. The information in this Drawing is currently available in four separate locations, some of which are not readily available to most designers/installers/maintainers. The centralization of the information provides one location that is readily available, including through the internet. Some of the users of this Drawing will not be UDOT driven, but will be Cities and Counties. The availability of this information in one place will facilitate helping our external customers as well.

Construction Engineers

N/A

Contractors

N/A

Suppliers

N/A

Consultants (as required)

N/A

Others (as appropriate)

FHWA (Roland Stanger) was involved in the consolidation process, and supports the Drawing.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None

3. Life cycle cost.

None

E. Safety Impacts?

None

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

None

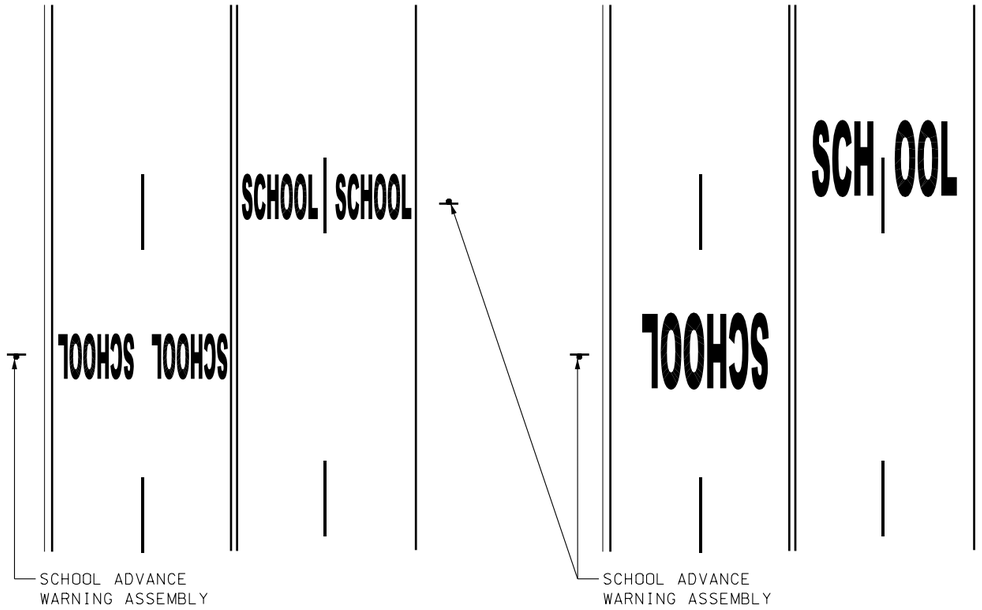
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

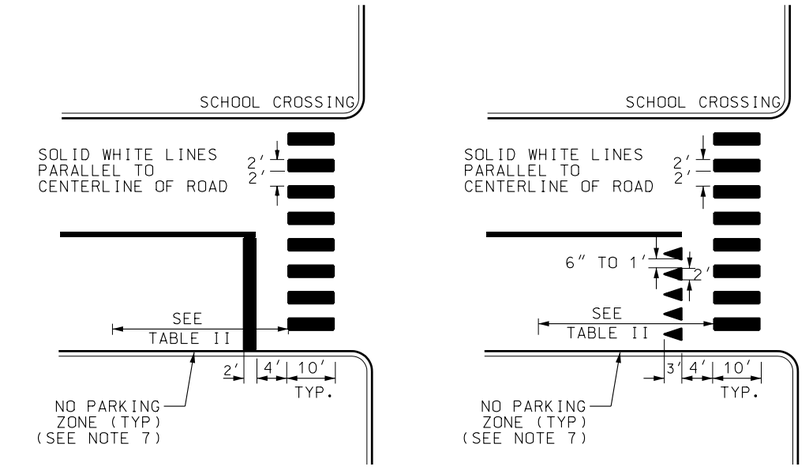


STANDARD

ONE MESSAGE PER LANE
ANY NUMBER OF LANES

OPTION

ONE MESSAGE PER TWO LANES
EVEN NUMBER OF LANES ONLY



STOP OR SIGNAL CONTROL

YIELD CONTROL

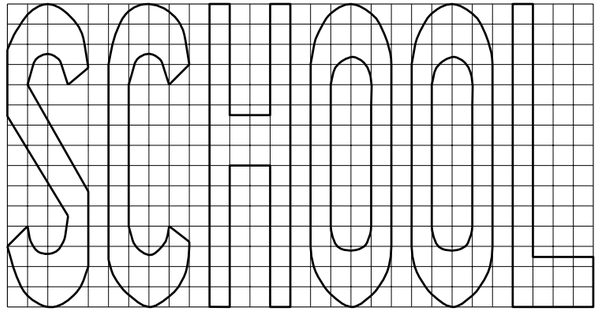


TABLE I

RECOMMENDED LETTER SIZES

ONE-LANE MESSAGE			
LANE WIDTH	**LETTER WIDTH INCHES**	**SPACE WIDTH INCHES**	**MINIMUM LETTER HEIGHT FEET**
12′	18	5	6
11′6″	17 1/4	4 1/2	6
11′	16 1/2	4 1/4	6
10′6″	15 3/4	4	6
10′	15	3 3/4	6
TWO-LANE MESSAGE			
ALL	32	8	10

TABLE II

NO PARKING ZONE

SPEED MPH	LENGTH FT
25	60
30	85
35	115
40	150
45	190
50	230

NOTES:

1. PLACE ALL SCHOOL MESSAGES, PAVEMENT MARKINGS, AND SIGNING IN CONFORMANCE WITH THE PART 7 SUPPLEMENT TO THE MUTCD, TRAFFIC CONTROLS FOR SCHOOL ZONES, CURRENT EDITION.
2. PLACE SCHOOL MESSAGE OPPOSITE SCHOOL ADVANCE WARNING ASSEMBLY.
3. SINGLE LANE MESSAGES (STANDARD)

   MAXIMUM MESSAGE WIDTH NOT TO EXCEED LANE WIDTH LESS 10 INCHES (FOR EXAMPLE, 12 FEET TRAFFIC LANE WIDTH LESS 10 INCHES EQUALS 11 FEET 2 INCHES MAXIMUM MESSAGE WIDTH).

   MESSAGE TO BE WHOLLY CONTAINED WITHIN TRAFFIC LANE, AND NOT ENCROACH UPON LANE STRIPING OR OTHER PAVEMENT MARKINGS.
4. TWO LANE MESSAGES (OPTIONAL)

   USE TWO-LANE MESSAGE ONLY WHEN THERE ARE AN EVEN NUMBER OF LANES.

   USE TWO-LANE MESSAGE UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.

   ONE-HALF OF MESSAGE TO BE CONTAINED IN EACH TRAFFIC LANE. WHEN A LANE MARKING IS LOCATED WITHIN THE SCHOOL MESSAGE, PLACE SUFFICIENT DISTANCE BETWEEN THE "H" AND THE "O" SO AS TO PROVIDE A MINIMUM OF 5 INCHES FROM THE CENTER OF THE MARKING TO THE EDGE OF EACH LEGEND.
5. USE 24 INCH STOP LINE.

   USE 24 INCH x 36 INCH YIELD LINE.
6. ESTABLISH A "NO PARKING" ZONE PRIOR TO SCHOOL CROSSING.
7. RED CURB MARKING IS OPTIONAL FOR "NO PARKING" ZONE.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — JULY 03,2002 DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — JULY 03,2002 DATE

DEPUTY DIRECTOR

SCHOOL CROSSING AND SCHOOL MESSAGE

STANDARD DRAWING TITLE

STD DWG
ST 9

Standard Committee Submittal Sheet

Name of preparer: Boyd Wheeler/ Bill Lawrence
Title/Position of preparer: Deputy Bridge Engineer/ Materials Engineer
Specification/Drawing/Item Title: Painting for Structural Steel, Cleaning and Repainting Structural Steel, Cleaning and Overcoating Structural Steel
Specification/Drawing Number: 09972, 09991, 09992
Date Process Started: Fall '02 Date Process Completed: _____
Status: ' Approved ' Disapproved ' Sent Back For Review

Enter appropriate priority level: (See last page for explanation) 3

The information listed below was copied from the submittal sheet for Feb '03.

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest

The evaluation of these specifications has been started due to the differences between specifications for painter qualifications and letter from FHWA. See attachment.

This is a progress update for the committee.

Propose to send letters to current painting contractors letting them know of the upcoming requirement and coordinate with SSPC for contractor training. Return modified specifications to Standards committee for approval and implementation in the fall to allow time for the contractors to become certified.

Draft language is as follows:

For new Structural Steel painting

All contractors and subcontractors that perform surface preparation or coating applications in the field shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application.
All contractors, subcontractors and/or fabricators that perform shop surface preparation and coating applications shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 3, or have an AISC catagory III painting endorsement, prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application.
Fabricators, painting contractors and painting subcontractors must remain so certified for the duration of the project. If a fabricator's, contractor's or subcontractor's certification expires, the company will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Department of any change in contractor certification status.

For field painting

All contractors and subcontractors that perform surface preparation or coating applications shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 2 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. Fabricators, painting contractors and painting subcontractors must remain so certified for the duration of the project. If a fabricator's, contractor's or subcontractor's certification expires, the company will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Department of any change in contractor certification status.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Measurement and payment are lump and will not change.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, materials, construction, safety, design, maintenance) (Include all applicable in-house areas)

David Nazare
Boyd Wheeler
Bill Lawrence
Jeremy Price

Construction Engineers

Lonnie Marchant

Contractors

Kelly Houston, Gateway

Suppliers

Consultants (as required)

Others (as appropriate)

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Slight Increase to unit bids to offset certification costs

2. Operational (For example, maintenance, materials, equipment, labor, administrative).

Reduction in evaluation costs of individual painters

3. Life cycle cost.

Improved quality in painting, improved life.

E. Safety Impacts?

Improved safety for lead based paint systems and properly trained individuals.

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Current process requires a yearly evaluation of painter.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

SECTION 09972

PAINTING FOR NEW STRUCTURAL STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Prepare and paint all surfaces except where indicated otherwise.

1.2 REFERENCES

A. ASTM E 11: Wire Cloth and Sieves for Testing Purposes.

B. Federal Standard No. 595: Color.

C. SSPC-SP 6: Commercial Grade Blast Cleaning.

D. SSPC-SP 10: Near White Blast

E. SSPC-PA1 : Surface Preparation

F. SSPC Paint Application Guide No. 3: "A Guide to Safety in Paint Application".

1.3 SUBMITTALS

A. Detailed plan for approval for protection methods that includes Environmental Protection.

B. Source and gradation of the sandblast abrasive.

C. Type and source of solvent, if required.

D. Manufacturer's information regarding the specified coating materials, including:
   1. Required wet- and dry-film thickness
   2. Project safety data
   3. Thinning recommendations
   4. Temperature requirements
   5. Profile recommendations
   6. Mixing and application procedures
   7. Required equipment

E. Test samples as required.

1.4 SAMPLES

A. Department tests samples from each batch or lot of paint using infrared and gas chromatography techniques prior to use.
   1. Submit samples to UDOT's Central Chemistry Lab.
   2. Paints must match the spectrum samples on file in the UDOT Central Laboratory.

B. Reject paint that does not match the standard.

1.5 PAINTER AND SANDBLASTER QUALIFICATIONS

A. ~~Department must approve individuals who perform painting and sandblasting, except for shop painting or sandblasting.~~

All contractors and subcontractors that perform surface preparation or coating applications in the field shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application.

All contractors, subcontractors and/or fabricators that perform shop surface preparation and coating applications shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 3 enclosed shop, or have an AISC category III painting endorsement, prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application.

Fabricators, painting contractors and painting subcontractors must remain so certified for the duration of the project. If a fabricator's, contractor's or subcontractor's certification expires, the company will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Department of any change in contractor certification status.

B. Disqualification:
   1. Engineer may withdraw qualification for questionable performance of the painter, blasting operator, or the equipment.
   2. Disqualification results from inadequate surface preparation, improper profile, runs, sags, overspray, thin film thickness, excessive film build-up, uneven coating, nonuniform color, improper curing, or any other defect in the coating system.

B. Coating application evaluation:

1. Establish a test area about 12 yd^2 as determined by the Department.
2. Obtain surface preparation approval from the inspector before applying paint.
3. Apply the coating using technique and application equipment consistent with the specified coating materials and with the paint manufacturer's recommendations.
4. Prepare the surfaces of the test area according to the project specifications.
5. Treat primer, intermediate, and finish coats as separate applications, waiting the specified drying time before inspecting each completed coat.
6. Painter, sandblaster, or both should consult with the manufacturer for answers to technical questions relating to the application of specified coating materials.
7. Take dry-film thickness readings on all portions of the test area including nuts and bolts.

C. Evaluation Criteria:

1. Ability to prepare the surface and to apply specified coatings with the proper tools and equipment.
2. Familiarity with specified coating material and acceptance criteria, and awareness of any difficulties in applying the coating to any specified surface.

D. Disqualification:

1. Lack of proper tools or equipment.
2. Inadequate surface preparation, improper profile, runs, sags, overspray, thin film thickness, excessive film build, uneven coating, nonuniform color, improper curing, or any other defect in the coating system.
3. Qualification may be withdrawn any time the qualifying inspector has reasons to question the performance of the painter, sandblaster, or the equipment.
4. The disqualified person or equipment may be required to re-qualify or be removed from

~~the project site at the option of the Engineer.~~

~~5. To requalify:~~

~~a. Engineer may accept the qualifications of a sandblaster or painter who has been qualified on a previous Department project within one year.~~

~~b. The sandblaster, painter, or both must re-qualify if any material or equipment changes are made from the original qualification.~~

~~E. Painter provides:~~

~~1. Coating materials properly mixed meeting the manufacturer's recommendations and project specification.~~

~~2. Necessary equipment for properly applying the specified coating.~~

~~3. Practice area outside the project limits to adjust and test the equipment before performing the test.~~

~~4. Safety and equipment as specified in SSPC Paint Application Guide.~~

~~5. Wet- and dry- film thickness gauges for testing the coating thickness during and after application.~~

1.6 PAYMENT PROCEDURES

A. Surface Preparation, or Painting, or both, are included in the contract lump sum price for structural steel.

PART 2 PRODUCTS

2.1 MATERIALS

A. Select a complete 3-part coating system consisting of a Zinc primer, Epoxy or Urethane intermediate coat and aliphatic Urethane top coat as approved by the New England Protective Coating Specification Criteria (NEPCOAT). This list may be found at
http://www.state.nh.us/dot/bridgedesign/pdf/nepcoatQPL.pdf
~~http://www.state.me.us/mdot/planning/products/nepcoat.htm.~~

B. Use paint color No. 26293 for the first field coat and No. 26306 for the top coat following Federal Standard 595.

PART 3 EXECUTION

3.1 INSPECTION

A. Engineer examines surfaces prior to surface preparation and prior to application of each succeeding coating. Correct any condition that is determined to negatively affect a proper coating application.

B. Provide safe access to permit inspection of the steel before and after painting. Use rubber rollers or other approved protective devices for scaffold fastenings. Do not mar or damage freshly coated surfaces.

3.2 PREPARING SURFACES

A. Painted steel: Clean surfaces with clean petroleum solvents and then blast clean to a near-white condition following SSPC-SP 10. Use clean oil-free air.

1. Grind off all fins, tears, slivers, and burred or sharp edges present on any steel member, or those that result from the blasting operation.
   a. Reblast where needed.
   b. Remove all mill ~~heavy~~ scale.
   c. Do not scar metal.
   d. Produce a 0.5 – 2 mils uniform profile.
2. Remove all abrasive and paint residue using either a commercial vacuum cleaner or by double blowing.
   a. Equip commercial vacuum cleaner with a brush-type cleaning tool.
   b. Double blowing: vacuum the top surfaces of all structural steel, including top and bottom flanges, longitudinal stiffeners, splice plates, hangers, etc., after the double-blowing operations are completed.
3. Keep the steel dust-free and prime within 24 hours after cleaning. Reblast to a near-white condition if any rust is visible before priming.

4. Protect freshly coated surfaces from subsequent blast-cleaning operations.
   a. Repair surface if damaged.
   b. Mask all areas requiring field welding before shop painting.
5. Have the surfaces inspected and approved by Engineer or Construction and Materials Division representative of Department before applying shop coat.
6. Apply the shop coat at the fabrication site.

B. Field painting:
1. Repair all damage to shop coat that occurs during shipping, handling, and erection.
2. Power wash steel without the field coat to remove contaminants or other foreign matter from the primed surface.
3. Blast clean any rusted areas to a near-white finish. Thoroughly clean the coating surrounding the blasted area and re-prime using an organic zinc from the same paint manufacturer and the same dry-film thickness specified for the shop coat. (SSPC-SP 10)
4. Remove all concrete drippings, abrasive and paint residue. If using double blowing, vacuum the top and bottom flanges, splice plates, longitudinal stiffeners, hangers, etc., after completing double-blowing operations.
5. Allow the touch-up coat to dry according to manufactures recommendation as listed on the paint data sheet. ~~least 2 days before applying the field coats.~~

C. Weathering steel:
1. Construct so that erection marks on the steel are not visible after the structure is completed.
2. Commercially sandblast all faying surfaces according to the specification standards. Meet SSPC-SP6.
3. Blast clean the following surfaces after the deck concrete is placed to specified surface finish:

a. Underside of the exterior portion of the top flange, and underside of all bottom flanges.
b. The exterior portion of web.
c. Top side and outside edge of the exterior portion of the bottom flange.

3.3 PREPARING PAINT MATERIALS

A. Mix and thin paint materials per manufacturer's product data sheets for both shop and field painting. If weather conditions require paint thinning, follow manufacturer's recommendations.

B. Mix the paint to a lump-free consistency with a high shear mixer (such as a Jiffy mixer), according to the producer's directions.
1. Do not use paddle mixers or paint shakers.
2. Keep paint in the original containers
3. Mix until all the metallic powder or pigment is suspended, and until all paint solids that may have settled to the bottom of the container are thoroughly dispersed.

C. Strain the paint through a screen having openings no larger than those specified for a No 50 sieve per the material standard. ASTM E 11.

D. After straining, continuously agitate the mixed material up to and during the time of application.

3.4 APPLYING PAINT

A. Apply each coat at proper consistency and thickness, and in accordance with the manufacturer's recommendations, including field coating. When using spray nozzles, use pressures recommended by the producer of the coating system.

B. Produce a uniform, even coating that bonds to the underlying surface. Follow SSPC-PA1.

C. Apply field coats at the construction site after steel erection work is completed.
   1. Do not apply field coats until Engineer approves the surface.
   2. Dry-film thickness of the first field coat should be greater than 4 mils.
   3. Keep the dry-film thickness of the top coat greater than 2 mils.

D. Weather:
   1. If weather conditions require paint thinning, follow the manufacturer's recommendations.
   2. Temperature of the air and the steel must be above 40 degrees F, but not so hot as to cause the paint to blister.
   3. Relative humidity must be less than 85 percent or the combination of temperature, and humidity conditions must inhibit surface condensation.
   4. Test humidity by applying a thin film of water to a small area. If the film evaporates with 15 minutes, the surface may be painted.

E. Remove ~~Scrape~~ any shop coat that shows any indication of ~~produces~~ "mud-cracking" or adds more than 7 mils to a soundly bonded coating or bare steel.

F. Thoroughly clean areas having deficient primer thickness to remove all dirt.

G. Apply an intermediate and top coat to any surface at the fabrication site that will be inaccessible for painting after field erection.

H. Do not load material for shipment until shop paint is dry to the touch, and until the UDOT inspection sticker is placed on the member by the inspector. Remove sticker before painting of field coats. ~~final inspection.~~

3.5 PROTECTION

A. Suspend work if protection is unsatisfactory.

B. Protect pedestrian and vehicular traffic.

C. Protect from splatter, splashes and overspray all portions of the structures that are not to be painted including superstructure, substructure, slope, and highway appurtenances. Protect where other damage during painting and blast cleaning operations could occur.

D. Use barriers during any blast-cleaning operations to protect pedestrians and vehicles, and to prevent spreading or falling of abrasive materials and debris on the traveled portions of the pavement. Remove any abrasive materials and debris on pavement, shoulders, or slope paving before reopening work areas to traffic.

E. Provide employees performing the blast-cleaning operations air-supplied sandblasting hoods approved by the US Bureau of Mines.

F. Minimum requirements for the air supply system:
   1. Airline filter, pressure-reducing valve with gauge, and pressure release valve.
   2. Do not allow the air supply to be contaminated with harmful materials or elements.

3.6 FIELD QUALITY ASSURANCE

A. Minimum Coating Thickness: Apply two or more coats if the required film thickness cannot be obtained by one coat without producing runs, bubbles, or sags.

END OF SECTION

SECTION 09991

CLEANING AND REPAINTING STRUCTURAL STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

~~A. Apply this section when repainting structural steel whose existing paint system does not contain a red lead primer.~~

A. Clean and repainting existing structural steel surfaces including all bearing units for existing paint systems that have red lead primer.

B. Remove existing paint from existing structural steel surfaces.

C. Prepare existing steel surface for repainting, and paint the cleaned structural steel surfaces.

1.2 REFERENCES

A. ASTM E 11: Wire Cloth and Sieves For Testing Purposes.

B. Federal Standard No. 595: Color.

C. SSPC-PA 1: Surface Preparation.

D. SSPC Paint Application Guide No. 3, "A Guide to Safety in Paint Application."

E. SSPC-SP10: Near White Blast.

F. SSPC-SP11: Mechanical Cleaning.

G. SSPC-Vis 1: Visual Standard.

1.3 QUALIFICATION AND EVALUATION

A. All contractors and subcontractors that perform surface preparation or coating applications shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 2 Category A, prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. Fabricators, painting contractors and painting subcontractors must remain so certified for the duration of the project. If a fabricator's, contractor's or subcontractor's certification expires, the company will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Department of any change in contractor certification status.

~~A. Coating Application Evaluation:~~

~~1. Establish a test area approximately 10 feet long, or as determined by the Engineer, and prepare the surfaces of the test area according to the project specifications.~~

~~2. Apply the coating using technique and application equipment consistent with the specified coating materials, and with the paint manufacturer's recommendations.~~

~~3. Allow the required drying time as prescribed by these specifications and the manufacturer's recommendations to elapse before taking the dry-film thickness readings.~~

~~4. Treat primer, intermediate, and finish coats as separate applications, allowing the specified drying time to elapse before inspecting each completed coat.~~

~~B. Engineer evaluates painters and blasting operators on:~~

~~1. Ability to prepare the surface, apply specified coatings to a uniform dry-film thickness, and use the proper tools and equipment.~~

~~2. Familiarity with the specified coating material and acceptance criteria, and awareness of any difficulties in applying the coating to any specified surface.~~

B. Disqualification:

1. Engineer may withdraw qualification for questionable performance of the painter, blasting operator, or the equipment.
2. Disqualification results from inadequate surface preparation, improper profile, runs, sags, overspray, thin film thickness, excessive film build-up, uneven coating, nonuniform color, improper curing, or any other defect in the coating system.

~~3. The disqualified person or equipment may be required to re-qualify or be~~

~~removed from the project site at the option of the Engineer.~~

~~D. Requalification:~~

~~1. The Engineer may accept the qualifications of a sandblaster or painter who has been qualified on a previous Department project within the year.~~

~~2. The blasting operator, painter, or both must re-qualify if any materials or equipment changes are made from the original qualification.~~

1.4 REQUIREMENTS FOR COATING APPLICATION

A. Have the painter, the blasting operator, or both consult with the manufacturer's technical representative for answers to technical questions relating to the application of the specified coating materials.

B. Obtain surface preparation approval from the Engineer before applying paint.

C. Use equipment capable of taking dry-film thickness readings on all portions including nuts and bolts.

1.5 PROJECT CONDITIONS/WEATHER LIMITATIONS

A. If weather conditions require paint thinning, follow the manufacturer's recommendations.

B. Apply paint only when the following weather conditions exist:

1. The temperature of the air and the steel: above 40 degrees F.
2. The relative humidity:
   a. Less than 85 percent, or such that the combination of temperature and humidity conditions inhibits surface condensation.
   b. To test humidity, apply a thin film of water to a small area. If the film evaporates within 15 minutes, the surface may be painted.

PART 2 PRODUCTS

2.1 MATERIALS

A. Blasting abrasive: type and size as specified.

B. Solvent: type and source as required.

C. Coating materials:

1. Mix properly following manufacturer's recommendations and project specifications.
2. Use necessary equipment for the proper application of the specified coating.

2.2 COATING SYSTEM

A. Select a complete 3-part coating system consisting of a Zinc primer, Epoxy or Urethane intermediate coat, and aliphatic urethane top coat as approved by the New England Protective coating Specification Criteria (NEPCOAT). This list may be found at http://www.state.nh.us/dot/bridgedesign/pdf/nepcoatQPL.pdf

B. Use manufacturer's information regarding the specified coating materials, including required wet- and dry-film thickness, project safety data, thinning recommendations, temperature requirements, profile recommendations, mixing and application procedures, and required equipment.

C. Use coating materials properly mixed meeting the manufacturer's recommendations and project specifications.

D. Paint Color: Federal Standard No. 595.
   1. Field coat: Color # 26293.
   2. Top coat: Color # 26306.

2.3 MIXING

A. Mix the paint to a lump-free consistency with a high shear mixer (such as a Jiffy mixer), according to the producer's directions.
   1. Do not use paddle mixers or paint shakers.
   2. Keep paint in the original containers and mix until all the metallic powder or pigment is suspended.
   3. Continue mixing until all solids that may have settled to the bottom of the container are thoroughly dispersed.

B. Strain the paint through a screen having openings no larger than those specified for a No. 50 sieve. ASTM E 11.

C. Continuously agitate the strained, mixed material up to and during the time of application.

2.4 QUALITY CONTROL

A Sampling:
   1. Take samples from each batch or lot of paint to be tested.
   2. Test the samples using infrared and gas chromatography techniques prior to use.
   3. Reject paint that does not match the standard. The prints must match the spectrum samples on file in the Central Laboratory.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean surfaces, including bearing units, of all oil, grease, and dirt with clean petroleum solvents or steam cleaning prior to blasting operation. SSPC-SP10.

B. Blast surfaces clean to near white with 0.5 to 2 mil profile.

C. Discoloration, light shadows, or slight streaks caused by stains of rust is not allowed on more than 5 percent of surface area.

D. Define acceptable surface preparation using SSPC-Vis 1.

E. Use SSPC-SP-11 to clean areas such as backside of base plates, corners, etc., that cannot otherwise be cleaned.

F. Prime the surface within 24 hours from blasting.

G. Do not prime the surface if rust has started to form. Clean the surface again before applying the prime coat.

H. Protection:
   1. Fully contain all material resulting from paint overspray.
   2. Enclosure system must withstand extreme high winds.
   3. Protect all portions of the structure that will not be painted.

3.2 APPLICATION

A. Conform to Field Inspection Provisions:
   1. Do not apply paint until the Engineer approves the prepared surface.
   2. Use rubber rollers or other approved protective devices on scaffold fastenings.
   3. Do not use metal rollers, clamps, and other types of fastenings which mar or damage freshly coated surfaces.

B. Apply paint with spray nozzles at pressures recommended by the producer of the coating system.

C. Prime Coat:
   1. Maintain the dry-film thickness of the prime coat between 2.5 and 6.0 mils.
   2. Apply two or more coats without producing runs, bubbles, or sags if the required film thickness cannot be obtained by one coat.
   3. Scrape any coat that produces "mud-cracking" or adds more than 7.0 mils to a soundly bonded coating or bare steel. Re-coat the surface.
   4. Thoroughly clean areas having deficient primer thickness with power washing equipment to remove all dirt. Wire-brush, vacuum, and re-coat the area.

D. Intermediate Coat: Paint as described in the standard specifications to produce a uniform, even coating which bonds to the underlying surface. SSPC-PA 1.
   1. Use the coating type and minimum dry-film thickness specified.
   2. Produce a dry-film thickness of the intermediate coat greater than 4 mils.

E. Finish coat: Keep the dry-film thickness greater than 2 mils.

F. Use wet and dry-film thickness gauges for testing the coating thickness during and after application.

G. Painting Safety: Follow SSPC Paint Application Guide No. 3, “A Guide to Safety in Paint Application."

END OF SECTION

SECTION 09992

CLEANING AND OVERCOATING STRUCTURAL STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Clean and overcoat existing structural steel surfaces including all bearing units for existing paint systems that have red lead primer.

1.2 REFERENCES

A. ASTM E 11: Wire Cloth and Sieves For Testing Purposes.

B. Federal Standard No. 595: Color.

C. SSPC 25: Prime and Intermediate Coat Paint.

D. SSPC 104, Type II: Specified Type of Paint.

E. SSPC-PA 1: Surface Preparation.

F. SSPC-SP3: Mechanical Cleaning.

G. SSPC Paint Application Guide No. 3 “A Guide to Safety in Paint Application.”

1.3 DEFINITIONS

A. Overcoating: spot prime, an intermediate coat, and a top coat of paint over the entire surface on each girder.

1.4 SUBMITTALS

A. The Contractor or the subcontractor must submit a written compliance program indicating that he has the equipment, training, containment and monitoring system to comply with OSHA's standard on lead exposure in construction, as published in Federal Register, Section 29 CFR 1962.62, May 4, 1993.

1.5 QUALIFICATIONS AND EVALUATION

A. The existing structure contains lead-based paint. It is mandatory that the painter and blasting operator be in total compliance with OSHA's standard on lead exposure in construction, as cited above.

B. All contractors and subcontractors that perform surface preparation or coating applications shall be certified by the Society for Protective Coatings (SSPC) to the requirements of SSPC QP 2 Category A, prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. Fabricators, painting contractors and painting subcontractors must remain so certified for the duration of the project. If a fabricator's, contractor's or subcontractor's certification expires, the company will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Department of any change in contractor certification status.

~~Coating Application Evaluation:~~

~~1. Establish a test area, approximately 10 ft long, or as determined by the Engineer.~~
~~2. Apply the coating using the technique and the application equipment consistent with the specified coating materials, and with the paint manufacturer's recommendations.~~
~~3. Prepare the surfaces of the test area according to the project specifications.~~
~~4. Allow the required drying time as prescribed by these specifications and the manufacturer's recommendations to elapse before taking the dry-film thickness readings.~~
~~5. Treat primer, intermediate, and finish coats as separate applications, allowing the specified drying time to elapse before inspecting each completed coat.~~

~~C. Criteria:~~

~~1. Ability to prepare the surface, apply specified coatings to a uniform dry-film thickness, and use the proper tools and equipment.~~
~~2. Familiarity with the specified coating material and acceptance criteria, and awareness of any difficulties in applying the coating to any specified surface.~~

~~D. Disqualification:~~

~~1. Engineer may withdraw qualification for questionable performance of the~~

painter, blasting operator, or the equipment.

2. Lack of proper tools or equipment is cause for disqualification.
3. Disqualification results from inadequate surface preparation, improper profile, runs, sags, overspray, thin film thickness, excessive film build-up, uneven coating, nonuniform color, improper curing, or any other defect in the coating system.
4. The disqualified person or equipment may be required to re-qualify or be removed from the project site at the option of the Engineer.

~~E. Requalification:~~

~~1. The Engineer may accept the qualifications of a sandblaster or painter who has been qualified on a previous Department project within the year.~~

~~2. The blasting operator, painter, or both must re-qualify if any materials or equipment changes are made from the original qualification.~~

1.6 REQUIREMENTS FOR COATING APPLICATIONS

A. Have the painter, the blasting operator, or both consult with the manufacturer's technical representative for answers to technical questions relating to the application of the specified coating materials.

B. Obtain surface preparation approval from the Engineer before applying paint.

C. Use equipment capable of taking dry-film thickness readings on all portions including nuts and bolts.

1.7 PROJECT CONDITIONS/WEATHER LIMITATIONS

A. If weather conditions require paint thinning, follow the manufacturer's recommendations.

B. Apply paint only when the following weather conditions exist:
   1. The temperature of the air and the steel: above 40 degrees F.
   2. The relative humidity:
      a. Less than 85 percent, or such that the combination of temperature and humidity conditions inhibits surface condensation.
      b. To test humidity, apply a thin film of water to a small area. If the film evaporates within 15 minutes, the surface may be painted.

PART 2 PRODUCTS

2.1 MATERIALS

A. Solvent: As recommended by the manufacturer.

2.2 COATING SYSTEM

A. Use a prime and intermediate coat. SSPC 25

B. Top Coat:

1. Gray tinted alkyd paint. SSPC 104, Type II.
2. Use Color No. 26306. Federal Standard No. 595.

C. Use manufacturer's information regarding the specified coating materials, including project safety data, thinning recommendations, temperature requirements, profile recommendations, mixing and application procedures, and required equipment.

D. Properly mix coating system. Meet the manufacturer's recommendations and project specifications.

E. Use necessary equipment for the proper application of the specified coating, observing safety practices found in SSPC Paint Application Guide No. 3, "A Guide to Safety in Paint Application."

F. Use wet and dry-film thickness gauges for testing the coating thickness during and after application.

2.3 TESTING

A. Provide samples from each batch or lot of paint prior to use.

B. UDOT Central Lab tests for acceptance.

2.4 MIXING PAINT

A. Mix the paint to a lump-free consistency according to the producer's directions.
1. Keep paint in the original containers and mix until all the pigment is suspended.
2. Continue mixing until all solids that may have settled to the bottom of the container are thoroughly dispersed.

B. Strain the paint through a screen having openings no larger than those specified for a No. 50 sieve. ASTM E 11.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean surfaces of all oil, grease, and dirt with clean petroleum solvents and low-pressure water-jetting wash.

B. Remove all corrosion, and all paint that shows peeling, brittleness, checking, scaling, or general disintegration, including bearing units.
   1. Use vacuum shrouded power tool cleaning.
   2. Remove paint from the area and beyond the edges of the area so that remaining paint system shows no rusting or blistering underneath, and adheres tightly to the surface. Remaining paint system should have sufficient adhesion that cannot be lifted as a layer by inserting a blade or putty knife under it.
   3. Feather the edges of the remaining paint system around the cleaned areas so the repainted surface appears smooth.

C. Protection:
   1. Fully contain all material resulting from surface preparation and paint overspray.
   2. Enclosure system must withstand extreme high winds.
   3. Protect all portions of the structure that will not be painted.

D. Recover a minimum of 95 percent of debris from cleaning operation.
   1. Sample debris from cleaning operation. Submit samples to UDOT Materials and an independent accredited Materials Testing Lab for composition and disposal evaluation.
   2. Place reclaimed waste paint in EPA-USDOT approved containment. Store at the project site.
   3. The Engineer tests the waste paint. Contact UDOT chemist at 965-4298. Submit paint composition and disposal evaluation results from the independent material testing lab. Disposition will be given to the contractor within 30 days. Dispose of waste paint as directed by the Engineer, submit disposal certificates for all waste paint.

3.2 APPLICATION

A. Do not apply paint until the Engineer approves the prepared surface.
   1. Use rubber rollers or other approved protective devices on scaffold fastenings.
   2. Do not use metal rollers, clamps, and other types of fastenings which mar or damage freshly coated surfaces.

B. Apply paint with spray nozzles at pressures recommended by the producer of the coating system.

C. Apply a minimum dry-film thickness of 2 mils spot prime, 2 mils intermediate coat, and a minimum of 1.5 mils for the top coat. Use a magnetic film thickness gauge for verification.

D. Apply two or more coats if the required film thickness cannot be obtained by one coat without producing runs, bubbles, or sags.

E. Paint as described in the standard specifications to produce a uniform, even coating which bonds to the underlying surface. SSPC-PA 1.

END OF SECTION

No supporting information for this agenda item

Standard Committee Submittal Sheet

Name of preparer: Barry Axelrod
Title/Position of preparer: Technical Writer
Specification/Drawing/Item Title: N/A
Specification/Drawing Number: N/A
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level:
(See last page for explanation) N/A

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Based on concerns about the numbering and format for Standard Specifications, the Measurement and Payment document, and the Standards web area an on-line survey was conducted between July 23 and August 25, 2003. Changes may be recommended based on the findings and recommendations of Standards and Specifications Section with the approval of the Standards Committee.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Changes may be recommended based on finds and evaluation.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

In puts received from several areas within the Department.

Construction Engineers

Contractors

Suppliers

Consultants (as required)

Others (as appropriate)

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

   None anticipated.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

   Unknown. Changes beneficial to the Department may be recommended.

3. Life cycle cost.

   None anticipated.

E. Safety Impacts?

No impacts at this time. Any recommended changes should impact safety to the benefit of all parties.

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Questions have been raised in the past about the formatting and numbering of Standard Specifications and the Measurement and Payment process as well as the navigation of the web site.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1	Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
Priority 2	Upon posting, this impacts projects being advertised.
Priority 3	Upon posting, the approved standard takes effect two weeks later for projects being advertised.

Standard Committee Submittal Sheet

Name of preparer: Terry Johnson
Title/Position of preparer: Senior Landscape Architect
Specification/Drawing/Item Title: Temporary Environmental Controls
Specification/Drawing Number: 01571
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

1. The current spec does not sufficiently address maintenance of erosion control features during construction and removal of these items at the end of construction. Several construction projects are being closed-out with unnecessary silt fence, check dams, etc. still in place. These erosion control devises left behind become maintenance problems. The revised spec clarifies the contractor’s responsibility to maintain and remove temporary erosion control features.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

1. As a preparer of temporary erosion control plans, I have not been using the current spec because of these issues and have been using a special provision instead.

2. Designers have contacted me stating that some construction engineers have requested pay items for removal of temporary erosion control features.

3. Copies of the revised spec have been sent to region landscape architects and they agreed the changes should be made.

Construction Engineers

1. I have talked with some construction engineers who say they have no recourse to require the contractor remove the silt fence at the end of construction. Some generous contractors remove it when asked and others want to be paid to remove it.

Contractors

1. In talking with contractors at the ECS training courses, they said that they were unaware that maintenance and removal was to be considered when bidding the erosion control items.

Suppliers

NA

Consultants (as required)

NA

Others (as appropriate)

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

   Since removal of the erosion control items are now specifically indicated in the spec, the contractors will probably be adding more to these items especially silt fence. Additional cost estimate - around 20% for silt fence, other items 5-10%.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

   Maintenance does not want the additional responsibility of removing silt fence that should have been taken care of during construction.

3. Life cycle cost.

E. Safety Impacts?

None

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

SECTION 01571

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for controlling surface environmental conditions at the construction site, and related areas under the Contractor's control.

B. Coordinating temporary erosion control measures.

1.2 RELATED SECTIONS

A. Section 01282: Payment.

B. Section 01574: Environmental Control Supervisor.

C. Section 02061: Select Aggregate.

D. Section 02373: Riprap.

D. Section 02610: Pipe Culverts.

E. Section 02613: Culvert End Sections.

F. Section 02922: Seed, Turf Seed, and Turf Sod.

1.3 REFERENCES

A. AASHTO M 288: Geotextile Specifications for Highway Applications.

1.4 TYPES

A. Check Dam:
   1. Intercepts and ponds sediment-laden ditch flows.
   2. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle out.
   3. Water exits the check dam by flowing over the top.

4. Types:
    a. Straw or Hay Bale
    b. Stone

B. Silt Fence Slope Barrier:
1. Intercepts and ponds sediment-laden sheet flow runoff from slopes.
2. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle out.
3. Water exits by percolating through the silt fence.

C. Slope Drain:
1. Collects and transports storm runoff down the face of a slope.
2. Consists of a berm at the top of the slope, a pipe culvert with end sections and outlet protection.
3. Used until permanent facilities are installed or until vegetation growth is adequate.

D. Drop-inlet Barrier:
1. Intercepts and ponds sediment-laden runoff.
2. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle out.
3. When pond height reaches the top of the barrier, water flows over the bales or stones and into the drop-inlet. If a silt-fence barrier is used, the ponded water percolates through the silt-fence fabric and into the drop-inlet.
4. Types:
    a. Straw or Hay Bale Drop-inlet Barrier
    b. Stone Drop-inlet Barrier
    c. Silt-Fence Drop-Inlet Barrier

E. Sediment Trap:
1. Intercepts and ponds sediment-laden concentrated flows.
2. Ponding the water reduces the velocity of the incoming flow and allows most of the suspended sediment to settle out.

F. Temporary Berm:
1. Diverts storm runoff from a recently constructed slope to a controlled release point.
2. Ridge of compacted soil, with or without shallow ditch.

G. Curb Inlet Barrier:
1. Intercepts Sediment-laden runoff.
2. Minor ponding may occur.

PART 2 PRODUCTS

2.1 MATERIALS

A. Check dams:
   1. Straw or hay bale:
      a. Twine bound hay or straw bales free from weeds declared noxious by the UDA.
      b. Hardwood stakes: 2 inch square (nominal) by 4 feet.
      c. Filter Fabric: AASHTO M 288.
   2. Stone: Well graded within 0.5 inch to 1.5 inch.

B. Silt Fence:
   1. Hardwood Post: 2 inch square (nominal) by 4 feet in length.
   2. Free Draining Granular Backfill Borrow: Refer to Section 02061.
   3. Filter Fabric: Synthetic, pervious sheet of propylene, nylon, polyester, or ethylene yarn. AASHTO M 288.
      a. Allows a flow rate of 0.067 gal/yd^2/min.
      b. Filter efficiency of 97 percent.
      c. With ultraviolet ray inhibitors and stabilizers.
      d. Provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees F. to 120 degrees F.
   4. Fasteners: Staples, wire, zip ties, or nails.

C. Slope Drain:
   1. Pipe Culverts: Refer to Section 02610.
   2. End Section: Refer to Section 02613.
   3. Riprap or Rock Lining: Refer to Section 02373. Fifty percent of the riprap to be between 6 inches and 12 inches with a maximum size of 12 inches and a minimum size of 4 inches.
   4. Hay or straw bales and hardwood stakes: Refer to this Section, Part 2, article, Check Dams.

D. Drop-Inlet Barriers:
   1. Straw or Hay Bale: Refer to this Section, Part 2, article, Check Dams.
   2. Stone: Refer to this Section, Part 2, article, Check Dams, Stone.
   3. Silt-fence: Refer to this Section, Part 2, article, Silt Fence.

E. Sediment Trap:
   1. Free draining granular backfill borrow: Refer to Section 02061.
   2. Riprap or Rock Lining: Refer to Section 02373, and this Section, this article, Materials, Slope Drain.

F. Temporary Berm: Existing Soil.

G. Curb Inlet Barrier:
1. Concrete Building Blocks.
2. Stone: Refer to this Section, Part 2, article, Check Dams, Stone.
3. Wire Mesh: 0.5 inch by 0.5 inch.

PART 3 EXECUTION

3.1 PREPARATION

A. Follow the Storm Water Pollution Prevention Plan (SWPPP) in the plan.
1. Address in the SWPPP all disturbed areas on a project including staging areas, haul roads, borrow sites, stockpiles, and disposal areas.
2. If SWPPP is not provided in the plans, create and submit a plan to the Engineer for approval.
3. Obtain written approval from the Engineer to change the SWPPP.

B. Designate a Environmental Control Supervisor (ECS) ~~SWPPP coordinator~~ who will:
1. Work directly with the Department ECS ~~SWPPP coordinator~~ designated by the Engineer.
2. Be available as needed to coordinate the SWPPP, inspect and maintain sediment control devices, and resolve other issues.

C. Do not start earth-disturbing work until SWPPP is approved, and appropriate temporary erosion and sediment control measures are in place.

~~D. Follow installation procedures outlined in the Standard Drawings.~~

E. Use the most restrictive requirement if a conflict occurs between erosion and sediment control specifications and federal, state, or local agency□s laws, rules, or regulations.

3.2 INSTALLATION

A. Provide or construct measures such as check dams, silt fence, slope drains, drop-in inlet barriers, sediment traps, and other erosion control devices or methods to prevent erosion and sedimentation during construction and/or shutdown periods.

B. Follow installation procedures outlined in the Standard Drawings.

3.3 INSPECTIONS

A. Inspect earthwork during construction to detect any evidence of the start of erosion. Pro-actively apply corrective measures in a timely manner as required.

B. Inspect all sediment retention structures Refer to Section 01574, article 3.4, SWPPP inspections.

3.4 MAINTENANCE

A. Maintain temporary sediment control devises to ensure they function properly until all disturbed areas draining to them are stabilized.

B. Remove and properly dispose of sediment when it has accumulated half way up the height or it interferes with the performance of the structure.

C. After all seeding and mulching has been placed and just before final closeout of the project, remove sediment from behind and around all erosion control features and remove erosion control devises as directed by the ENGINEER. Seed areas where the sediment was removed following Section 02922 Seed, Turf Seed and Turf Sod.

D. Dispose of sediment removed from erosion control structures in a manner acceptable to the ENGINEER.

END OF SECTION

Standard Committee Submittal Sheet

Name of preparer: Terry Johnson
Title/Position of preparer: Senior Landscape Architect
Specification/Drawing/Item Title: Environmental Control Supervisor
Specification/Drawing Number: 01574
Date Process Started: _____ Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

1. The State Division of Water Quality has a new on-line form for contractor’s to submit Notice of Intent permit requests. Changed the spec to reflect this new procedure. (This item is a minor change and will not be addressed further in the comments)

2. Environmental compliance is a serious issue on UDOT construction projects and has not been receiving the attention it deserves. On some projects, both Department and state regulators have placed projects in non-compliance only to have their warnings ignored - even with a $500.00 per day penalty. Construction personnel have stated that the current non-performance penalty of $500.00 per day needs to be increased. This purposed amendment increases the non-performance penalty to $1000.00 per day after three days of non-performance and increases to $1500.00 per week after seven days.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

In a lessons learned meeting with construction engineers in region one, they commented that the current non-performance penalty of $500.00 was not significant enough to get the contractor's attention. We concluded that the $500.00 per day penalty for non-performance would remain the same for the first three days. After three days of continued non-performance, the penalty increases to $1000.00 per day and after seven days, the penalty increases to $1500.00 per day until the project is in environmental compliance.

Contractors

Didn't talk with any of them. I'm sure they are not happy with additional potential for penalties. UDOT currently provides Environmental Control Supervisor (ECS) training for contractors and the Department pays the contractor's ECS to oversee environmental compliance.

Suppliers

NA

Consultants (as required)

NA

Others (as appropriate)

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No change

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

   No change

3. Life cycle cost.

E. Safety Impacts?

   None

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

SECTION 01574

ENVIRONMENTAL CONTROL SUPERVISOR

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of the responsibilities of the Contractor's Environmental Control Supervisor (ECS) to monitor and document environmental mitigation and compliance on the project.

1.2 RELATED SECTIONS

A. Section 01355: Environmental Protection

B. Section 01561: Temporary Environmental Fence

C. Section 01571: Temporary Environmental Controls

D. Section 02911: Mulch

E. Section 02922: Seed, Turf Seed, and Turf Sod

1.3 SUBMITTALS

A. Submit to the Engineer, certification that the Contractor's proposed ECS has attended and passed the examination for UDOT's Environmental Control Supervisor Training. Contact the UDOT Environmental Section for more information.

B. Submit a NOI and a NOT to the Division of Water Quality at the Department of Environmental Quality (DEQ) as described under Article 3.3.

C. Submit Storm Water Pollution Prevention Plan (SWPPP) inspection reports to the Engineer within 24 hours of the inspection as set forth under Article 3.4.

1.4 ECS QUALIFICATIONS

A. Attend UDOT's Environmental Control Supervisor Training and pass the examination.

B. Knowledge of erosion control principles and best management practices for roadway construction sites.

C. Knowledge of the laws surrounding environmental clearances and how to obtain these clearances required under Section 01355, article 1.8 Environmental Clearances by the Contractor.

D. Be sufficiently knowledgeable to understand the significance and implementation of environmental plans, details, and specifications.

1.5 NON-PERFORMANCE PENALTY

A. A $500 non-performance penalty assessed against the Contractor for each calendar day, or portion thereof, during which the project is in non-compliance with permits and regulations. If the Contractor is still in non-compliance after three days, the penalty increases to $1000 per day and increases to $1500 per day after 7 days. This penalty does not include fines issued by regulatory agencies.

B. No extension of contract time allowed for any project delay resulting directly or indirectly from a violation of project environmental requirements.

PART 2 PRODUCTS **Not used.**

PART 3 EXECUTION

3.1 GENERAL RESPONSIBILITIES

A. Successful implementation of all environmental protection commitments and the correct installation of environmental mitigation measures associated with the project.

B. Keep the project in environmental compliance.

C. ECS responsibilities take precedence over any other work commitments.

D. Obtain environmental clearances as addressed in Section 01355, article 1.8 Environmental Clearances by the Contractor for disturbances, waste sites, staging areas, for example not provided in the Contact.

E. Be available at all times (24-hours a day) during the active project construction to respond as necessary to environmental compliance and to the direction of the Engineer. Be available as needed during seasonal shutdowns.

3.2 REGULATORY AGENCY COORDINATION

A. Work through the Engineer to maintain coordination and communications between the Contractor, Department, and Regulatory Agencies. Process all official communications through the Engineer.

B. Coordinate and conduct on-site meetings on an as-needed basis with Regulatory Agency Inspectors. This could include Regulatory Inspectors from the Utah Division of Water Quality, Utah Division of Water Rights (Stream Alterations), U.S. Army Corps of Engineers (wetlands), and U.S. Fish and Wildlife Service.

C. Notify the Engineer in writing of the results of any agency coordination meeting within 24-hours.

3.3 UTAH POLLUTION DISCHARGE ELIMINATION SYSTEM (UPDES) PERMIT COMPLIANCE

A. ~~Prepare, sign, and submit to the Engineer for signature a Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the UPDES General Permit No. UTR 100000. NOI forms can be obtained from the DEQ or UDOT.~~
Prepare and submit a Notice of Intent (NOI) form for Storm Water Discharges with Construction Activity. NOI forms can be completed online at the Division of Water Quality website at http://secure.e-utah.org/swp/client.

B. Do not start earth-disturbing activities until the completed ~~and signed~~ NOI form has been submitted to the Division of Water Quality at the DEQ.

C. Work directly with the Department SWPPP coordinator designated by the Engineer.

D. Place temporary or permanent stabilization measures (for example, mulch, erosion control blankets) as soon as practicable but in no case longer than 14 days unless construction activities resume on that portion of the site within 21 days when activity ceased. If snow cover precludes the mulch placement, apply as

soon as practicable. Seasonal shutdowns require that mulch be placed for all disturbed portions of the project.

E. Do not start earth-disturbing work until project perimeter temporary erosion measures and those protecting environmentally sensitive areas are in place and approved.

F. Understand that the erosion control measures on the SWPPP are diagrammatic and must be adapted in the field to meet their intended purpose. As the project progresses through the various construction phases, implement the appropriate erosion control measures for that stage. Make necessary changes to the SWPPP to accommodate construction sequencing.

G. Obtain approval from the Engineer to make changes to the SWPPP. Install additional erosion control measures as directed by the Engineer.

H. Be available as needed to coordinate the SWPPP, make necessary changes, inspect, maintain sediment control devices, and resolve other sediment and erosion control issues.

I. Monitor earthwork during construction to detect any evidence of the start of erosion. Pro-actively apply corrective measures.

J. Apply the appropriate maintenance of temporary erosion controls. Refer to Section 01571.

K. At the end of construction, submit a Notice of Termination (NOT) form to the Division of Water Quality to terminate the permit. NOT forms can be obtained at the DEQ or UDOT.

3.4 SWPPP INSPECTIONS

A. At the commencement of earth moving activity, start performing inspections of all temporary erosion control measures a minimum of once every seven calendar days and within 24 hours after any storm event greater than 0.5 inch. Where construction sites have been temporarily or seasonally shut down, conduct inspections once a month.

B. Invite UDOT's SWPPP coordinator appointed by the Engineer to the inspections.

C. After each inspection, complete an inspection report and submit it to the Engineer within 24 hours. Include the following information:
   1. Name(s) of personnel attending the inspection.
   2. Date of inspection

3. List of problems identified in the previous inspection and document if corrections have been made.
4. List by station, earth-disturbing activities since previous inspection.
5. List by station, erosion and sediment control measures installed since previous inspection.
6. List by station, new and unresolved problems encountered with specific erosion control measures and describe solutions to be implemented.

END OF SECTION

Change One
Revised August 29, 2002
Articles Revised
1.2 B

Standard Committee Submittal Sheet

Name of preparer: **Jim Baird**
Title/Position of preparer: **Right of Way Review Engineer**
Specification/Drawing/Item Title: **Boundary Survey**
Specification/Drawing Number: **02896**
Date Process Started: August 28, 2003 Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level: 3
(See last page for explanation)

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The first change: Article 3.1 A5 was added to make sure the surveyor marks the exact control point on the top of the right of way marker.

The second change: Article 3.3 C 3and 4 were modified to better define what is required on the survey plat.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Region Right of Way

The Region 2 Right of Way Surveyor, Wendell Hathaway, made the request that the contractor surveyor be required to mark the precise location of the survey mark on top of the Right of Way Marker. This is standard to the survey community and UDOT has done this for years. However there have been incidents recently where a surveyor refused to put mark on the Right of Way marker because our specs didn't require it. We are attempting to close the loophole by this revision.

Those contacted

1. Essy Rahimzadegan., Region 1 Right of Way
2. Wendell Hathaway, Region 2 Right of Way
3. Jeff Baird, Region 3 Right of Way
4. Nancy Jerome, Region 4 Right of Way

Construction Engineers

Contractors

Suppliers

Consultants (as required)

Others (as appropriate)

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price. **None**

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming). **None**

3. Life cycle cost. **None**

E. Safety Impacts? **None**

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

There have been several instances in the past where the surveyor has not placed a control mark on the top of the R/W marker which creates problems when trying to establish ties to centerline or other control points. The same is with the plat information when all necessary information is not given, trying to relocate is difficult.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1	Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
Priority 2	Upon posting, this impacts projects being advertised.
Priority 3	Upon posting, the approved standard takes effect two weeks later for projects being advertised.

SECTION 02896

BOUNDARY SURVEY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide boundary survey, and plat.

B. Furnish and set right-of-way markers.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete.

1.3 REFERENCES

A. ASTM A 53: Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

PART 2 PRODUCTS

2.1 RIGHT-OF-WAY MARKERS

A. Pipe: As shown in Standard Drawing GW 6. Meet ASTM A 53, Schedule 40, Galvanized.

B. Cast bronze cap: Free from defects and constructed as shown in Standard Drawing GW 6.

2.2 CONCRETE

A. Class B concrete per Section 03055.

B. May substitute higher class of concrete.

PART 3 EXECUTION

3.1 RIGHT-OF-WAY MARKERS

A. Place Right-of-Way Markers in accordance with Standard Drawing GW 6, including stamping onto each Right-of-Way Marker:
   1. Control Line station
   2. Elevation (To 2 decimal places)
   3. Professional Land Surveyor's License Number
   4. Year
   5. The exact control point location to within 0.01 feet.

B. Tightly rivet cap to the pipe.

3.2 BOUNDARY SURVEY

A. Provide record of survey plat by Utah licensed surveyor.

B. File mylar copy of plat with county surveyor, region, and Central Right-of Way offices of Department.

C. Accuracy: Third Order, and Class I (1/10,000).

3.3 PLAT COMPLIANCE REQUIREMENTS

A. Utah Code 17-23-17.

B. Department procedure “Design Process.”

C. Show on the survey plat:
   1. Survey coordinates accurate to 5 decimal places and elevations accurate to 2 decimal places on all right-of way markers.
   2. Right-of-Way markers.
   3. Adjacent quarter corners and section corners with bearings and distances along the section line to the control line from each adjacent corner.
   4. Original highway control points (right-of-way markers).
   5. Local city or county monuments.
   6. Control line geometric information with references ties to section and quarter corners.

D. Compute and draw plat, stationing, and coordinates to the same units as the project drawings.

E. Deliver a copy of the survey plat to Engineer on a 3-1/2 inch disk in MicroStation format.

F. Correction Factor: Show state plane to ground correction factor.

G. Show the latitude and longitude of the control line at the beginning and end of the project.

END OF SECTION

Change One – August 29, 2002
No changes made

Change Two – December 19, 2002
No changes made

Change Three – February 27, 2003
Articles Revised
2.1 A, B and 3.1 A drawing number corrected

Change Four – April 24, 2003
No changes made

Change Five – June 26, 2003
No changes made

Change Six – August 28, 2003
Articles Revised
3.1 A 5 added
3.3 C 3 and 4

Standard Committee Submittal Sheet

Name of preparer: Sam Sherman
Title/Position of preparer: ITS Engineer
Specification/Drawing/Item Title: Roadway Weather Information System - Environmental Sensor Station (RWIS-ESS) and associated drawings
Specification/Drawing Number: RWIS-1 through RWIS-4, Special 13592S
Date Process Started: 8-28-03 Date Process Completed: _____
Status: ‘ Approved ‘ Disapproved ‘ Sent Back For Review

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on their web page. (http://www.udot.utah.gov/esd/specbook/StandardsCommittee.htm)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Lack of previous standard.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Modified supplemental specification.

C. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

TOC RWIS Manager, ATMS maintenance personnel and ITS deployment technicians were contacted and reviewed the modified standard plans.

D. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None anticipated.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Not Applicable.

3. Life cycle cost.

Not Applicable.

E. Safety Impacts? None.

F. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

The standard drawings are adapted from the installation guides from the state contracted weather equipment providers. The drawings have been modified to meet Utah requirements for access, junction box details, and fencing protection.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect two weeks later for projects being advertised.

SECTION 13592S

ROADWAY WEATHER INFORMATION SYSTEM - ENVIRONMENTAL SENSOR STATION (RWIS-ESS)

PART 1 GENERAL

1.1 SECTION INCLUDES

Site preparation: install buried conduit per industry standard and associated junction boxes with grounding rods, tower foundation, and fence installation per design plans or as directed by UDOT representative.

~~A. Materials and procedures for installing Roadway Weather Information System - Environmental Sensor Station (RWIS-ESS).~~

1.2 RELATED SECTIONS

A. Section 02324: Compaction

B. Section 02330: Embankment

C.~~A~~. Section 02776: Concrete Sidewalk, Median Filler, and Flatwork

D.~~B~~. Section 02821: Chain Link Fencinge~~e~~ and Gates

E.~~C~~. Section 03055: Portland Cement Concrete

F.~~D~~. Section 03211: Reinforcing Steel and Welded Wire

G.~~E~~. Section 03310: Structural Concrete

H. Section 13553: ATMS Conduit

I. Section 13554: Polymer Concrete Junction Box

1.3 REFERENCES

A. NEC 250-1: National Electric Code

PART 2 PRODUCTS

2.1 POWER

A. Use electrical components as listed and defined by the National Electric Code (NEC).

B. Supply and install ~~a 30A breakered weatherproof disconnect per manufacturer's instructions in a manner not to encumber operation of the tower or sensors.~~ Conduit, ground rods, and junction boxes. Install in each conduit a detectable pull tape with (one foot) incremental measurement markings. Tensile strength will be 1200 ft lb.

C. Install solar power array and connect with RPU per manufacturer's specifications.

2.2 RPU TOWER FOUNDATION AND SERVICE ~~TOWER~~ PAD

A. Use Class AA (AE) concrete per Section 03055.

2.3 TOWER GROUNDING SYSTEM

A. Wire: 32 strand, #210 weight, 7/16 inch tinned copper ground cable. ~~off each corner of the tower on top of concrete pad to a distance 10 ft away from the tower.~~

~~1. Ground Wire - use #10 solid, bare, soft-drawn, copper wire as specified.~~ For all three legs, starting from the outside ground rod, clamp wire and run wire to the ground rod three feet from the tower. Clamp the wire to the ground rod. **DO NOT cut the wire.** Then, run the wire across the top of the concrete pad to the corner of the RWIS tower. Grounding wire to be attached to the tower to be installed by others.

B. Ground Rod: ½ inch diameter 10 foot copper clad. Two per corner; one, 3 feet away and one~~,~~ 10 feet away.

~~C. Ground AC disconnect to the nearest ground rod.~~

2.4 ENVIRONMENTAL SENSORS, REMOTE PROCESSING UNIT (RPU), COMMUNICATION EQUIPMENT, AND TOWER

A. All sensors to be installed by others. ~~Environmental sensors, cabinet, remote processing unit (RPU), and tower are furnished by the Department. The environmental sensors may include, but are not limited to, the following:~~

~~1. Wind speed indicator~~

~~2. Wind direction indicator~~

~~3. Relative humidity sensor~~
~~4. Air temperature sensor~~
~~5. Precipitation detector~~
~~6. Visibility sensor~~
~~7. Multiple pavement sensors~~
~~8. Sub-grade temperature probe~~
~~9. Required communication modem for design specified communication method.~~

~~B. Department furnished manufacturer's detailed installation instructions in addition to instructions shown in RWIS plan sheets.~~

2.6 FENCE AND GATE

A. Follow tower ~~Department~~ or UDOT ~~-~~provided design specification.

PART 3 EXECUTION

3.1 GENERAL

A. Conform to the requirements of the National Electric Code (NEC).

B. Tower site location and pavement sensor placement must by approved on site by the UDOT ITS Engineer at (801) 887-3744 or designee prior to construction.~~The Engineer approves tower site location staking and pavement sensor placement prior to construction.~~

C. Provide ~~Engineer~~ a preliminary installation schedule to the UDOT ITS Engineer specified in Part 3.1.B and UDOT construction Engineer ~~and schedule a pre-installation meeting~~ 30 days prior to start of work.

D. Pick up State-furnished materials at the following:
Utah Department of Transportation
Traffic Operations Center (TOC)
2060 South 2760 West
Salt Lake City, Utah 84104-4592

E. Contact UDOT ITS Engineer at (801) 887-3744 ~~Engineer~~ seven calendar days before pick-up date.

F. Install all State-furnished materials per manufacturer's instructions, unless noted otherwise in these.

3.32 RPU TOWER FOUNDATION AND TOWER

A. Follow Sections 03055 and 03211.

B. Provide all necessary grading for a flat and level site.

C. Finish all surface concrete with Ordinary Surface Finish per Section 03310.

D. Do not weld conduit to tower. Follow manufacturer's installation instructions.

E. Place the concrete directly into the excavation. Use minimum forming above ground.

F. RPU tower to be installed by others. ~~Install tower securely on foundation as indicated. Follow all manufacturer's installation instructions.~~

3.43 PAVEMENT SENSORS

A. To be installed by others. ~~Install all pavement and sub-grade sensors as indicated. Follow all manufacturer's installation instructions.~~

~~B. Manufacturer trained or certified personnel, manufacturer representative or designee oversees installation of pavement sensors.~~

~~C. Install all cabling between sensors and processing unit. Follow all manufacturer's installation instructions.~~

3.54 CABINET, PROCESSING UNIT

A. To be installed by others. ~~Install cabinet as indicated per manufacturer's installation instructions.~~

3.65 COMMUNICATION EQUIPMENT

A. To be installed by others. ~~Install all cabling between communication network equipment and modem at RPU. Follow all manufacturer's installation instructions.~~

~~3.6 FOUNDATION PAD~~

~~A. Install concrete maintenance pad per Section 02776.~~

3.7 FENCE AND GATE

A. Furnish and install Chain Link Fence and Gate per Section 02821.

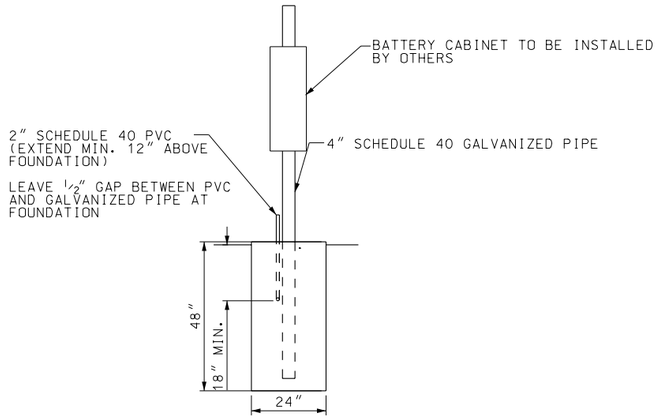
B. Furnish and install 7 foot high Type IV fence, with barbed wire and arm, with 5 foot wide gates.

C. Orient fence gates, and size the fence dimensions per manufacturer or Department specifications.

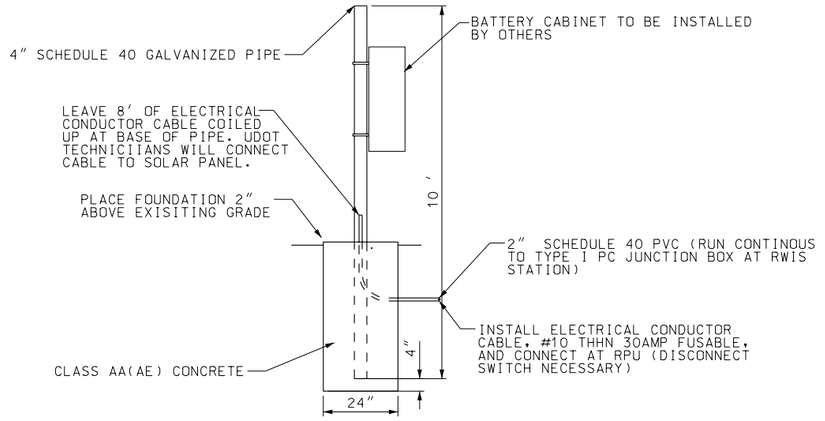
~~D. Install anti-climb plating to tower as provided by manufacturer.~~

END OF SECTION

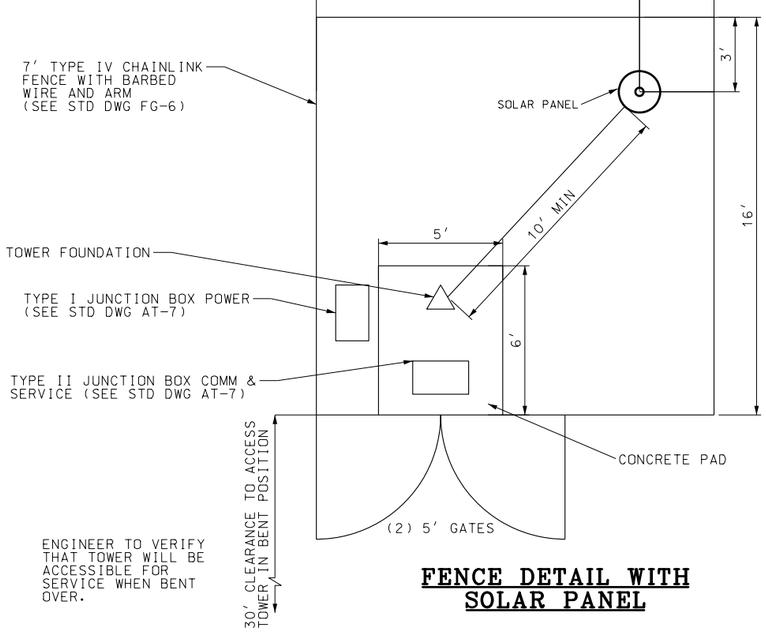
RWIS SITE AND FOUNDATION DETAILS



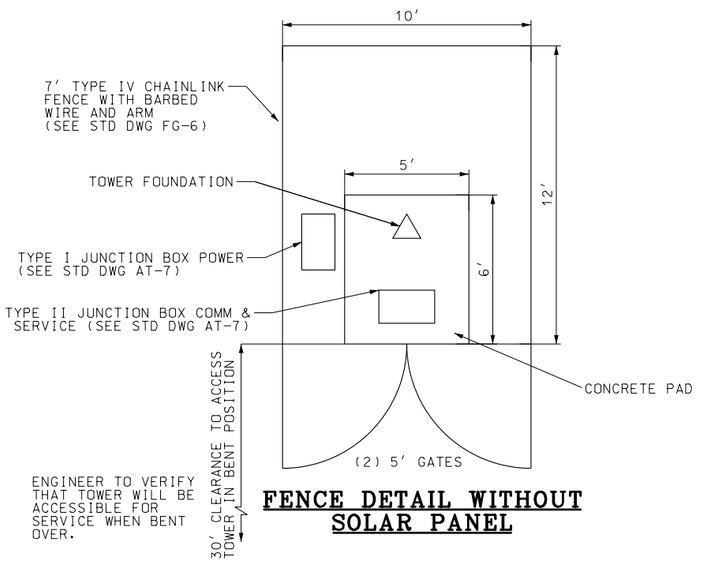
SOLAR PANEL FOUNDATION DETAIL (RIGHT SIDE VIEW)



PHOTOCELL FOUNDATION DETAIL (FRONT VIEW)



FENCE DETAIL WITH SOLAR PANEL



FENCE DETAIL WITHOUT SOLAR PANEL

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — DATE

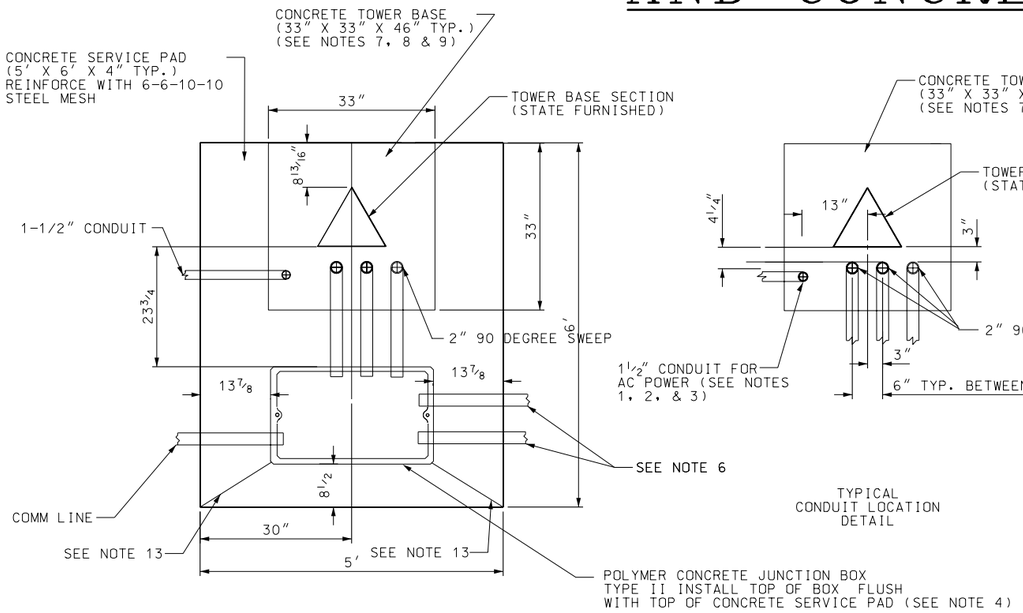
DEPUTY DIRECTOR

RWIS SITE AND FOUNDATION DETAILS

STANDARD DRAWING TITLE

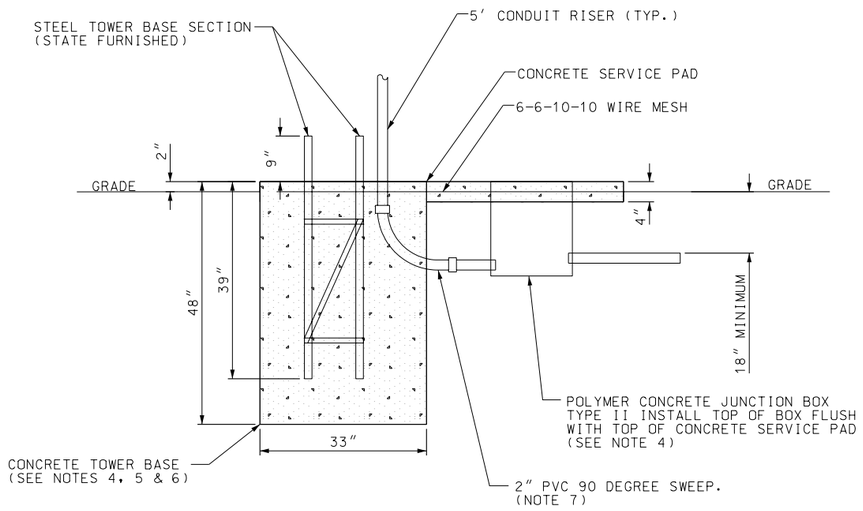
STD. DWG. NO.
AT 15

RPU TOWER BASE AND SERVICE PAD LAYOUT AND CONCRETE FORMING DETAILS

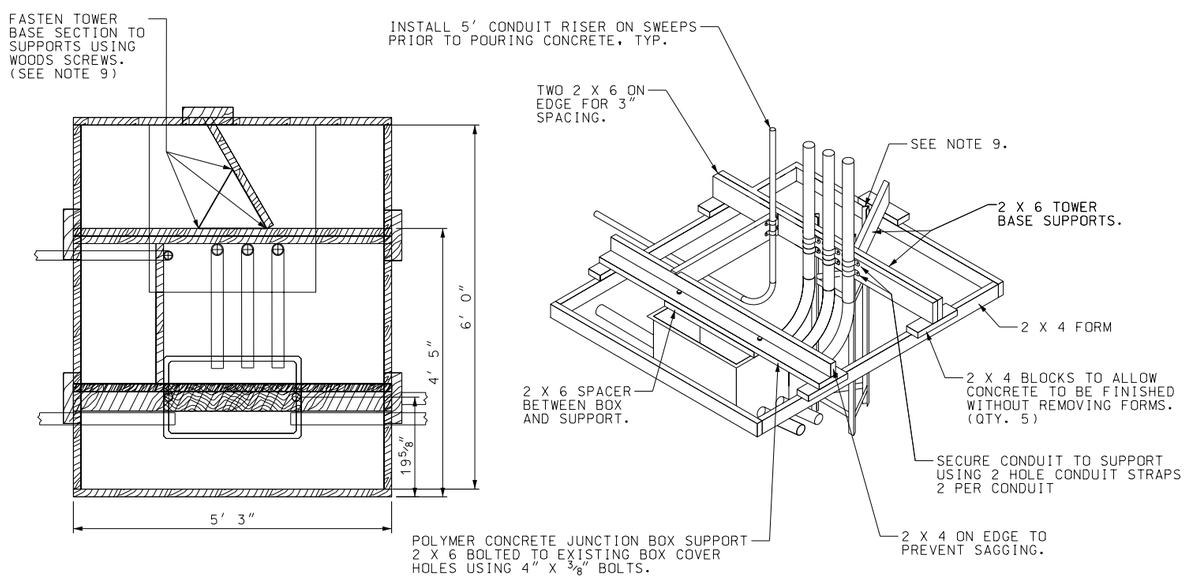


RPU TOWER BASE & SERVICE PAD INSTALLATION DETAIL

TYPICAL CONDUIT LOCATION DETAIL



RPU TOWER BASE & SERVICE PAD INSTALLATION DETAIL (LEFT SIDE VIEW)



RPU TOWER BASE & SERVICE PAD CONCRETE FORM DETAIL

NOTES:

1. ALL CONDUITS ARE SCHEDULE 40 PVC.
2. STUB OUT 1 1/2" POWER SERVICE INTO TYPE I JUNCTION BOX.
3. CONDUIT LOCATIONS SHOWN ARE FOR A SQUARE D TYPE D SAFETY SWITCH, CATALOG # D221NRB.
4. INSTALL JUNCTION BOXES AS PER STD DWG #AT 7.
5. INSTALL ALL CONDUITS IN TOWER BASE CONCRETE TO PERMIT CONTINUATION TO RPU ENCLOSURE.
6. STUB OUT 2" CONDUIT FROM POLYMER CONCRETE JUNCTION BOX TO BEYOUND SERVICE PAD FOR SENSOR CABLES. ORIENT TOWARD NEXT JUNCTION BOX AS APPROPRIATE.
7. CONCRETE, MINIMUM CLASS AA(AE).
8. ALL SENSOR CABLES INSTALLED TO POLYMER CONCRETE JUNCTION BOX AND PULLED THROUGH 2" 90 DEGREE SWEEP INTO RPU ENCLOSURE.
9. THE TOP OF THE TOWER BASE SECTION MUST BE LEVEL TO ASSURE A STRAIGHT AND PLUMB TOWER INSTALLATION.
   THE TOP OF THE TOWER BASE MUST BE 9" ABOVE THE CONCRETE PAD.
10. FINISH CONCRETE WITH A SLIGHT CROWN TO DRAIN WATER.
11. THE FORM DETAIL SHOWN IS TYPICAL FOR A FLAT SURFACE INSTALLATION. MODIFY AS APPROPRIATE FOR FIELD CONDITIONS.
12. CONTRACTOR IS RESPONSIBLE FOR INCORRECTLY INSTALLED OR DAMAGED STATE FURNISHED EQUIPMENT AND MATERIALS.
13. WHEN FINISHING CONCRETE SCORE A LINE FROM THE CORNER OF THE BOX TO THE CORNER OF THE CONCRETE FOR AN EXPANSION JOINT.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — DATE

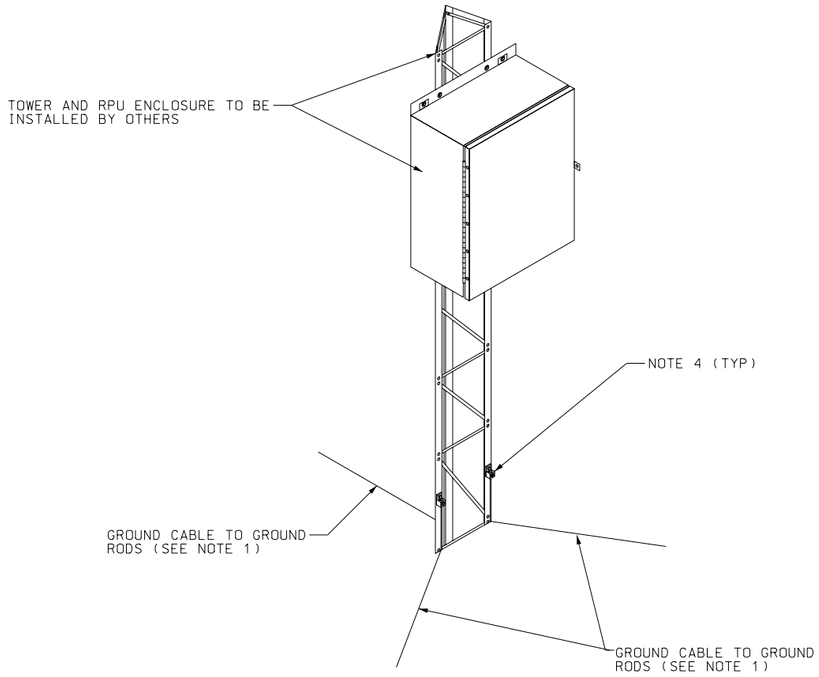
DEPUTY DIRECTOR

RPU TOWER BASE AND SERVICE PAD LAYOUT

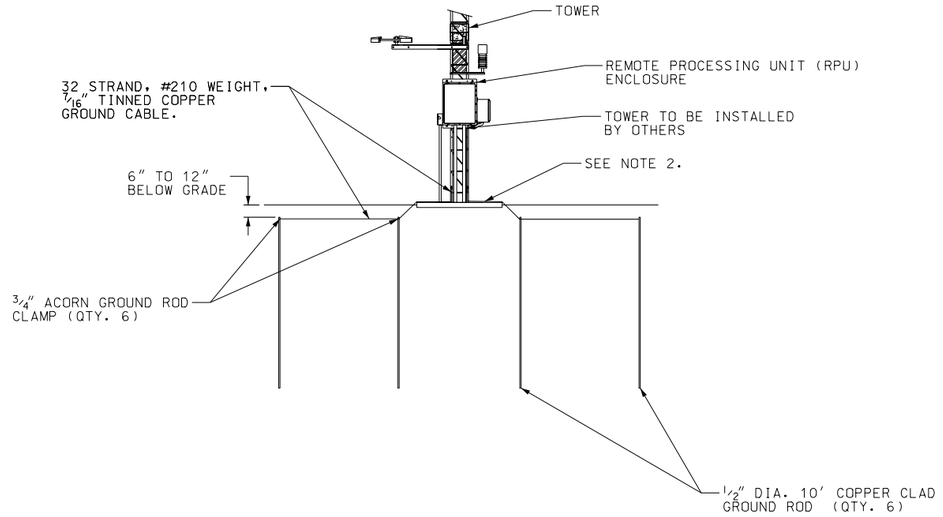
STANDARD DRAWING TITLE

STD. DWG. NO.
AT 16

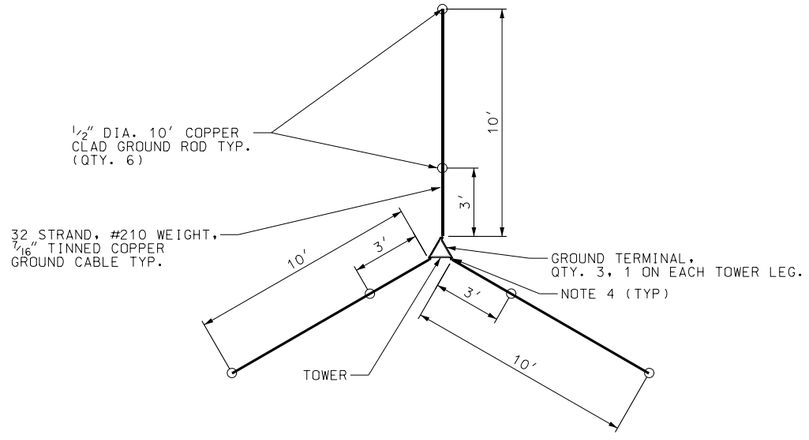
GROUND ROD INSTALLATION AND TOWER GROUNDING DETAIL



GROUND CABLE TERMINATION DETAIL



GROUND ROD INSTALLATION DETAIL (PROFILE VIEW)



GROUND ROD INSTALLATION DETAIL (PLAN VIEW)

NOTES:

1. DO NOT INSTALL GROUND CABLES IN CONCRETE PAD, RUN ON TOP.
2. ANCHOR GROUND CABLES FLAT AGAINST CONCRETE PAD WITH SUITABLE CLAMPS/ANCHORS. LEAVE EXCESS WIRE TO BE ATTACHED TO TOWER BY OTHERS
3. DUCT SEAL UNDERGROUND CONDUIT OPENING AFTER INSTALLING GROUND WIRE.
4. ON ALL THREE LEGS, CONTRACTOR TO INSTALL GROUNDING WIRE AND RODS. COIL AND LEAVE 10 FEET OF WIRE FOR INSTALLATION BY OTHERS.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — DATE

DEPUTY DIRECTOR

GROUND ROD INSTALLATION AND TOWER GROUNDING

STANDARD DRAWING TITLE

STD. DWG. NO.
AT 17

End of Agenda Package